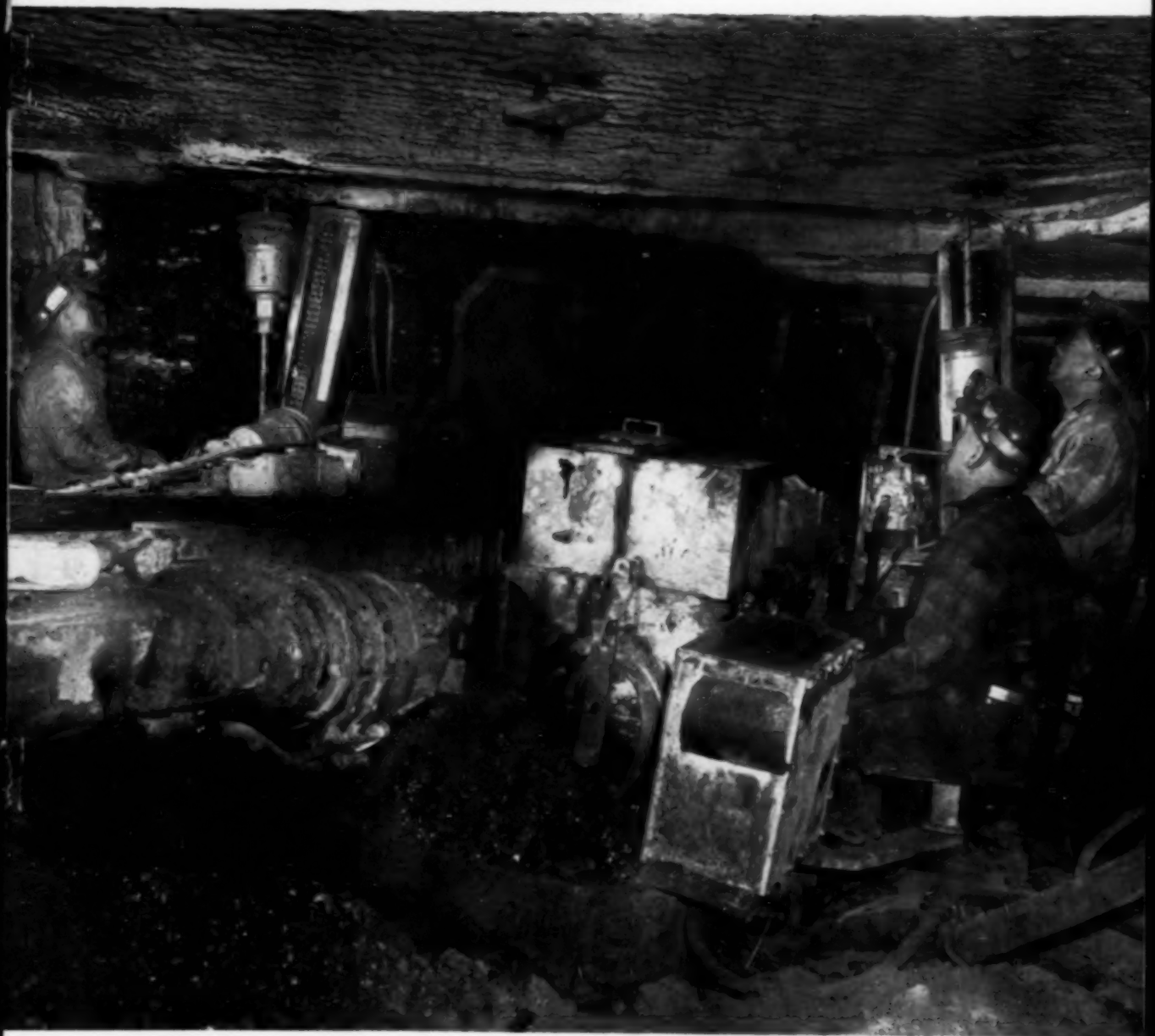
COAL AGE

A McGRAW-HILL PUBLICATION

JULY 1958

Raw-Coal Storage . . . . . p 74
Continuous Mining . . . . . p 86
Overburden Drilling . . . . p 92

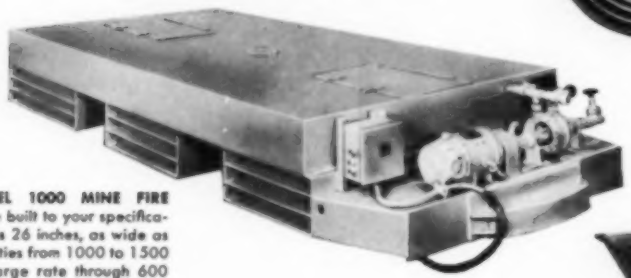
PRICE $1



$1-Million Modernization Pay-Off . . . p 66

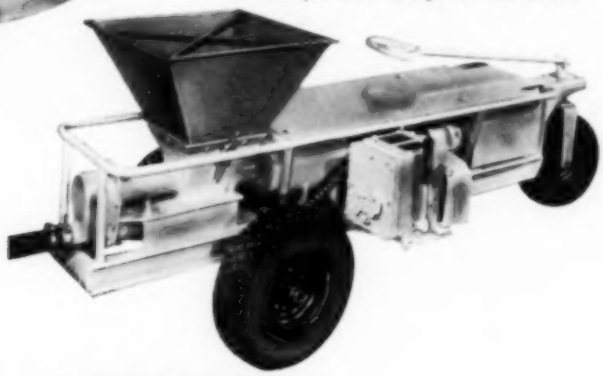
THESE MSA PRODUCTS HELP YOU FIGHT MINE FIRES INSTANTLY

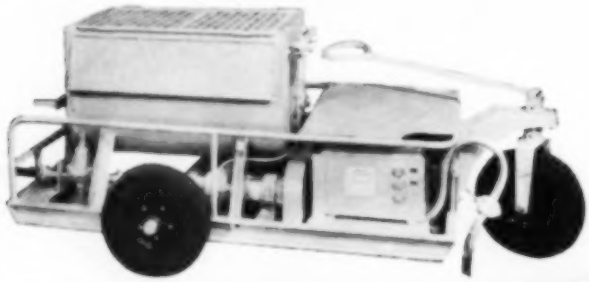
M-S-A MINE FIRE HOSE is especially designed for rugged mine use. It's impervious to rot and vermin. Never needs drying. Lightweight. Easy to handle. Dated and branded for your protection.



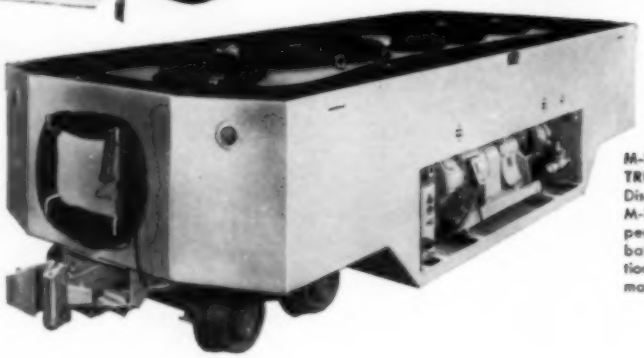
M-S-A BANTAM 400 ROCKDUST DISTRIBUTOR applies rockdust wet or dry. Availability of this machine in the working place, and the men's familiarity with its operation, make it ideal for fighting fires at their inception. Discharges dry dust through as much as 400 feet of hose at an average of 30 lb. per minute. Discharges wet dust at a rate of 50 lb. per minute through 150 feet of hose.

M-S-A MODEL 1000 MINE FIRE TRUCK can be built to your specifications: as low as 26 inches, as wide as 7 feet. Capacities from 1000 to 1500 gallons. Discharge rate through 600 feet of M-S-A Mine Fire Hose is 50 gallons per minute at 50 psi.





M-S-A SLURRY ROCK DUST DISTRIBUTOR can pump a slurry of rockdust and water—the cheapest fire-fighting agents for mine fires—through as much as 1000 feet of hose at the rate of 120 lb. per minute.



M-S-A MODEL 2100 MINE FIRE TRUCK has 2100-gallon capacity. Discharge rate through 600 ft. of M-S-A Mine Fire Hose is 91 gallons per minute at 150 psi. Tank is fully baffled with triple weld construction. Truck is designed for easy maneuverability.

Any delay in fighting a fire may prove disastrous. Often, the sealing of an entire mine or section results. Such an operation is not only hazardous. It's costly.

This threat to human lives and vital mining equipment, however, can be greatly reduced. You can do it with one or more of the indispensable items described above.

A minimum investment in MSA fire-fighting equipment *now*, may save you thousands of dollars later. Write us for helpful literature.

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Cuts costs $5,400 yearly with B.F.Goodrich fire-resisting belt

B. F. Goodrich improvements in rubber brought extra savings

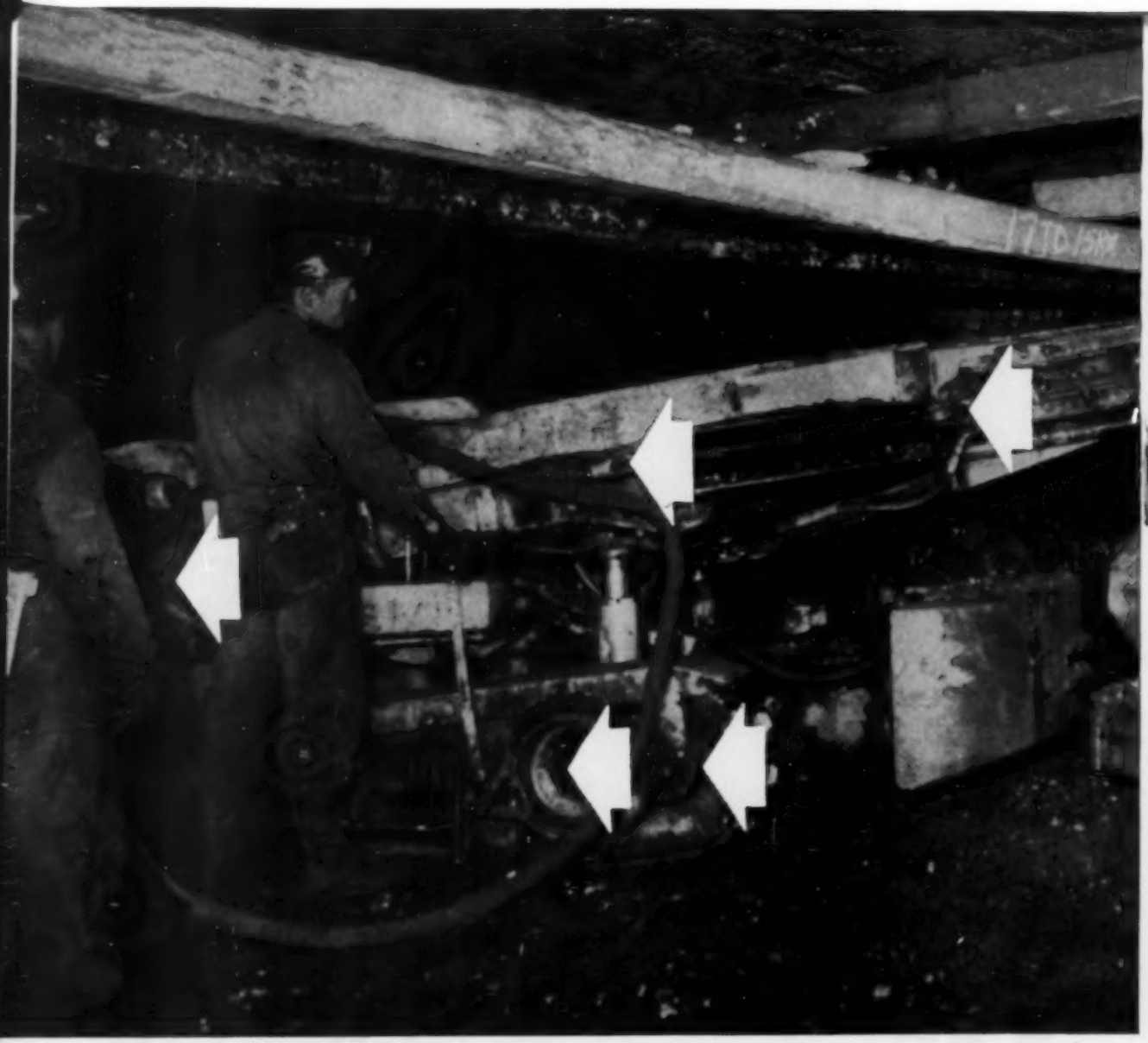
Problem: Operators of this West Virginia mine had a choice of two ways to protect against the possibility of a conveyor belt spreading fire in their modern, new mine. They could use an ordinary conveyor belt and build ventilation stoppings in the cross ducts along the belt line to prevent main air supply from feeding a fire, or they could use a fire-resisting belt.

What was done: When they figured the savings that would result, they purchased a B.F.Goodrich Caricoal belt made with fire-resisting rubber. This belt will not support combustion or spread fire, and is accepted for listing as fire-resistant by The Bureau of Mines (Acceptance No. 28-6). The special fire-resisting rubber in this belt also has high resistance to impact, abrasion, oil, grease, tearing, cutting, gouging and even mildew attack.

Savings: The chief engineer estimated that the B.F.Goodrich fire-resisting belt eliminated 60 ventilation stoppings a year. Figuring $90 each for labor and materials, this is an annual savings of $5,400, or a total of $54,000 over the ten-year life span of the belt.

Where to buy: Your B.F.Goodrich distributor has full information on the conveyor belt described here. And, as a factory-trained specialist in rubber products, he *can* answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Company, Dept. M-398, Akron 18, Ohio.*

B.F.Goodrich *industrial products*



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Texaco Multifak is designed as the all-purpose bearing lubricant. It pumps easily at low temperatures. It withstands moisture and prevents wear and rust through a wide range of operating temperatures. It has a high resistance to oxidation.

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representative will include Texaco Crater—or for spray application, Crater X Fluid—in your Simplified Lubrication Plan. Crater keeps cables strong longer and open gears running smoothly.

There are many ways to reduce lubricant inventories. A Texaco representative can sum them up in one of Texaco's famous Simplified Lubrication Plans, put together especially for your mine. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

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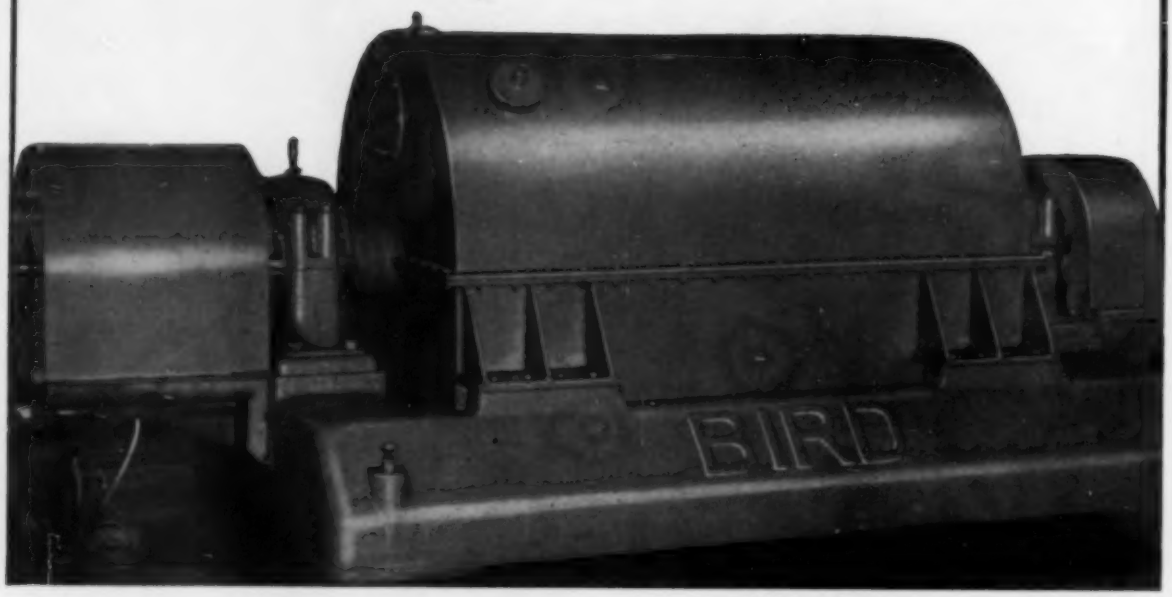
(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

Why Dewater Half-Millimeter x 0 Coal

The Hard Way?



This neat, clean, easy to operate *Bird Solid Bowl Centrifuge* gives you the driest coal that can be obtained mechanically. Close regulation of feed consistency is no longer necessary. Cyclone or thickener underflows are thoroughly dewatered at low cost per ton.

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This Month in COAL AGE

JULY 1958

Features This Month:

Editorial ..... p 65

$1 Million Modernization Pays Off At Harmar Coal's Oakmont Mine ..... p 66

Raw-Coal Storage Bins Lead To Increased Daily Output ..... p 74

Low-Cost Heavy-Media Cleaning ..... p 80

Productive Continuous Mining Under Difficult Conditions ..... p 86

Better Drill Cuts Cost at 40 to 1 Mine ..... p 92

Designs for Gas-Well Pillars ..... p 96

NCA Convention Report ..... p 104

Central Appalachian Section—AIME ..... p 110

Departments This Month:

Coal Commentator p 11 — News Roundup p 26

Foremen's Forum p 114 — Operating Ideas p 118

Equipment Developments p 122

► Deep Mining, Haulage

$1 Million Modernization Pays Off At Harmar Coal's Oakmont Mine ..... p 66

Complete modernization of the transportation system at Oakmont mine made possible a 50% reduction in haulage cost and a 29% boost in over-all productivity. Six men per shift handle transportation from the section to river barges. Flexibility in mining achieved with continuous miners and conventional units in irregular seam conditions adds to over-all efficiency at western Pennsylvania mine.

Extras—How door-tripping dogs are controlled automatically; mining plans; safety incentives.

► Coal Storage

Raw-Coal Storage Bins Lead To Increased Daily Output ..... p 74

An increase of 1,000 tpd of marketable coal loaded at the preparation plant measures the increase in efficiency achieved at Enos Coal Co. through the addition of raw-coal storage bins. Two 1,500-ton bins, constructed of tunnel-liner plate, cushion the cleaning operation from the adverse effects of field delays and vice versa. New large coal haulers permit two-shift loading in the pits, further increasing overall economy.

Star Billing—Line drawing of storage and reclaiming conveyors, showing how they serve bins or plant.

► Coal Preparation

Low-Cost Heavy-Media Cleaning ..... p 80

New heavy-media vessel, patented by W. C. Menzies, designer of the Menzies cone cleaner, provides a middlings product from the single vessel in anthracite-cleaning applications. The system may be operated with a single pump, depending upon location of magnetic densifier, and all reclamation and sizing screening on product side of vessel is done using a single drive at one plant. Power requirements are low.

Checklists—Power requirements for 150- and 60-tph systems.

► Continuous Mining

Productive Continuous Mining Under Difficult Conditions ..... p 86

Viking Coal Corp., working the Indiana No. 5 seam near Terre Haute, employs an AC-powered Model 76-AM Colmol to recover 43 in of the 50-in seam, leaving top and bottom coal. Best performance so far is 400 tons in a single shift from a crew of seven face workers.

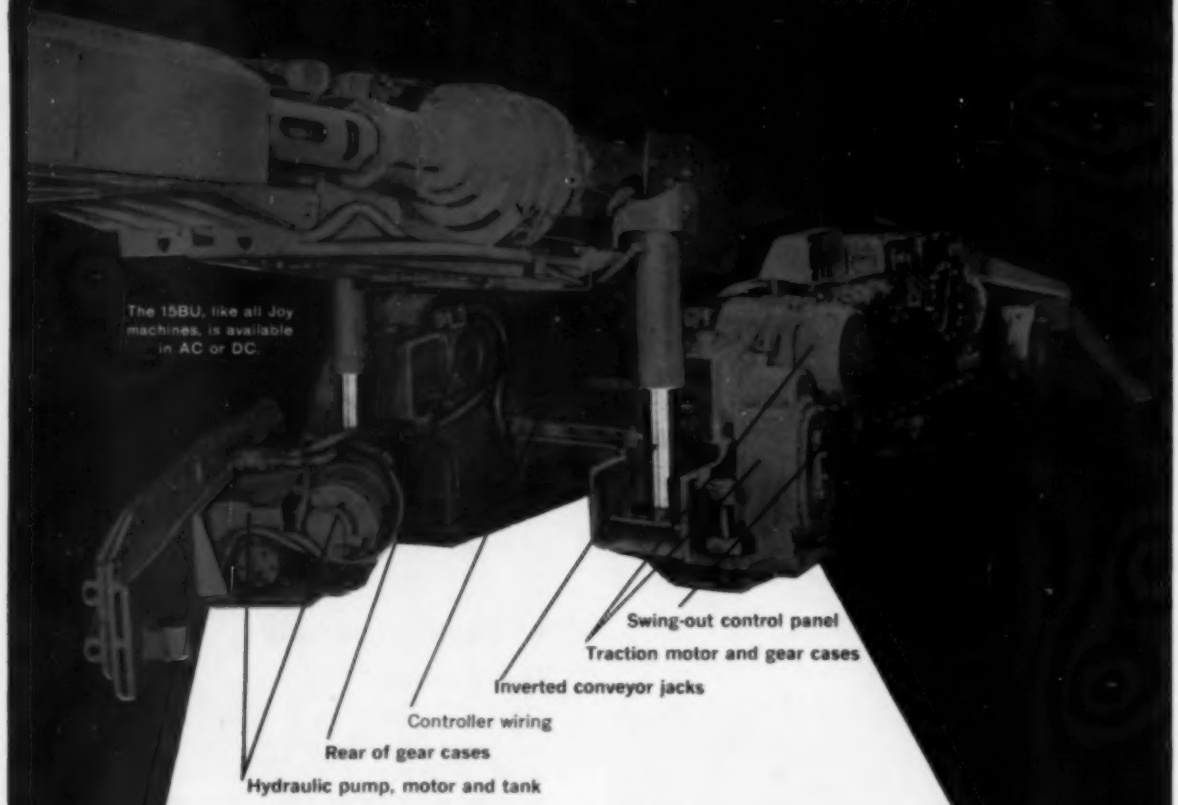
(*Continued on p 7*)

COAL AGE, July 1958, Vol. 63, No. 7. Published on the 1st with additional issue in Mid-July by McGraw-Hill Publishing Co., Inc. Publication office, Third & Hunting Park Ave., Philadelphia 40, Pa. United States subscription rate for individuals in the field of the publication $3 per year; single copies $1. Second class mailing privileges authorized at Philadelphia, Pa. For additional information see p. 11.

Postmaster: Please send Form 3579 to Coal Age, 330 W. 42nd St., New York 36, N. Y.

new JOY 15BU LOADS 15 TONS PER MINUTE

HAS "swing-out" SERVICE PANELS


The 15BU, like all Joy machines, is available in AC or DC.
Swing-out control panel
Traction motor and gear cases
Inverted conveyor jacks
Controller wiring
Rear of gear cases
Hydraulic pump, motor and tank

REAL ACCESSIBILITY TO ALL OPERATING AND CONTROL MECHANISMS . . . A JOY FIRST!

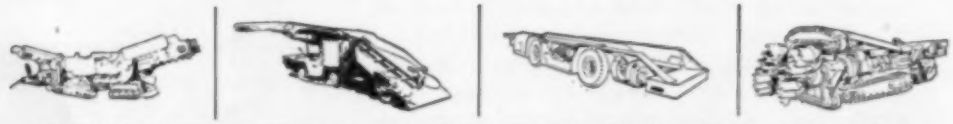
For the first time, all sections requiring regular inspection, servicing or maintenance can be reached from the outside. The hydraulic pump, motor and oil tank are mounted on the swing-out bumper. The electrical control panels swing open with all controls mounted on the inside of the hinged cover plate. And, all motors and drives are mounted outside the frame.

This easy, fast servicing, together with quick, responsive, high-tonnage operation, gives you the chance to make a substantial reduction in costs-per-ton . . . the savings you need to maintain or increase your profit margin today.

The 15BU is just one of many new machines designed by Joy for faster, more efficient mining . . . the result of a continuing program of research and development. **Joy Manufacturing Company,** Oliver Building, Pittsburgh 22, Pa. In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.

WRITE FOR BULLETIN 233A-1

JOY EQUIPMENT FOR MINING . . . FOR ALL INDUSTRY



CONTINUOUS MINERS, MOBILE LOADERS, SHUTTLE CARS, COAL CUTTERS, CUTTING MACHINE TRUCKS, COAL DRILLS, CONVEYORS, TIMBER SETTERS, SHUTTLE CAR ELEVATORS, BELT FEEDERS, FANS, BITS, PORTABLE BLOWERS, COMPRESSORS ROCK DRILLS, HOISTS, CORE DRILLS

WSW CL7045-233

Room panels are designed to permit full pillar recovery with least maneuvering of the machine. Chemically-treated mine water is successfully used in dust-allaying sprays.

Good Idea—Extra-width crawlers on Colmol reduce ground pressure to preserve soft bottom material.

► Overburden Preparation

Better Drill Cuts Cost
At 40 to 1 Mine ..... *p 92*

An improved overburden drill solves the problem of getting low-cost drilling in thick, hard rock at the Robbins Coal Co., Inc., Oneonta, Ala. Overburden ranges up to 100 ft thick and stripping ratios sometimes are as high as 40 to 1. New design features of the drill make it possible for crews to do in 16 hr per day and one less day per week the work that formerly required around-the-clock operation 7 days a week.

Sidelights—Details of new design features; blasting practices with ammonium nitrate and oil mixture as explosive agent.

◄ Underground Safety

Designs for Gas-Well Pillars ..... *p 96*

George J. Donaldson Jr. and **James G. Tilton,** Mining Engineers, Peoples Natural Gas Co. and Equitable Gas Co., Pittsburgh, Pa.

An act of the Pennsylvania legislature regulates the sizes of protective pillars which must be left to support gas wells which pierce coal seams. Framing of the legislation reflects cooperative approach among gas and coal industry engineers and officials of Pennsylvania Dept. of Mines and Mineral Industries in gathering data on well failures and setting up guides to prevent similar incidents in the future. Consensus is that an 8-deg sup-

(*Continued on p 9*)

This Month in COAL

SOME IMPROVEMENT—Though the first half wound up with bituminous production off 22%, there was some encouragement in a slight comeback in the production rate to between 8 and 9 million tons per week in June. For the most part, this reflected the beginning of Lake shipments on a major scale after a delayed start of several weeks. However, improved demand resulting from a modest improvment in the business picture was a noticeable element.

Anthracite, too, had a slow first half dropping to 10,400,000 tons, or 23%, under the first half of 1957.

BETTER AHEAD?—Some forecasts put steel in the second half 10 million tons ahead of the first half. An increase of 10 million in steel output would mean an approximately equal increase in the demand for coal. Construction continues to do well, home building is increasing, the farmers are feeling fairly flush and the end of inventory drawdown is in sight. These and other favorable portents cannot be added up to a beginning boom, however, as long as autos continue in low gear, in turn keeping down steel and general manufacturing. But here again the feeling was growing that better times are ahead.

Conclusion? A sizeable improvement in the overall picture as the year wears on.

1957 IN EXPORTS—As in domestic consumption, the overseas export rate continues to lag behind 1957, while attempts by foreign mining industries and importing countries to reduce the total continue. Basically, the picture remains one of need for substantial tonnages in Europe. Thus, overseas exports of bituminous still are expected to reach or exceed 40 million tons in 1958, some 18 million under 1957. But rumors of wholesale cancellation of contracts have remained, for the most part, merely that, though stretchouts were more common. Beyond 1958, a continued rise to 50 million or better is confidently expected.

ONE BOOM—The onset of July set the stage for at least one boom in 1958—air conditioning. In many areas in the South and near South, the summer electric-utility load has become equal to or greater than the winter load—with air cooling the major reason. Even in the North, many utilities look for big new summer demand. In fact, many are actively promoting the use of not only cooling equipment, but also electric heating of all types in the winter months to build load in that direction also. The '58 cooling season and the '58-'59 heating season may well stand out in the future as the real takeoff in cooling and the real start of electric heating.

TIGHTER STILL—Though coal as yet is almost completely apathetic on stream polution, the advocates of tighter controls and the administrators of legislation and compacts already in existence are anything but. As a case in point, the Pennsylvania Sanitary Water Board scheduled a meeting in June to discuss the imposition of much stricter limits on solids and acid in mine-water discharge. One deterrent to practically immediate promulgation is a definition of the terms used in the proposed regulations. But the situation in Pennsylvania, as well as in other areas, is considered really serious by those keeping track of developments.

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Whether you operate one truck or twenty trucks, you can't buy a tire that costs less per mile than Firestone. Billions of miles of carefully kept fleet records prove Firestone truck tires outwear all others.

Firestone has always built extra stamina into every Firestone truck tire. But now Firestone brings you a brand-new kind of tire rubber—Firestone Rubber-X. Exhaustive truck tire tests proved Firestone Rubber-X is the longest wearing rubber ever used in tires!

Teamed with S/F (Shock-Fortified) cord, Firestone Rubber-X means still more trouble-free mileage, still lower costs per mile. No wonder now more than ever, more going concerns go on Firestones! Ask about Firestone Rubber-X at your Firestone Dealer or Store. That's the place for fast, dependable service, too!

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YOU CAN'T BUY A TUBELESS OR TUBED TIRE
THAT COSTS LESS PER MILE THAN FIRESTONE

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Firestone

BETTER RUBBER FROM START TO FINISH

port angle sets the minimum mining radius under various depths of cover.

High Spot—Solid- and split-pillar plans for use at all depths of mining.

Foremen's Forum ..... *p 114*

Recent news reports tell how a supervisor and his crew saved their own lives following a mine fire by barricading. Suggestions on how, where and when to take such steps are set down in Foremen's Forum.

Operational Ideas ..... *p 188*

Mine cars converted to fire trucks; flexible carrier speeds equipment moves; special truck delivers lubricants; pry bar removes tight bolts—these are efficiency-building ideas for practical application now.

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COAL AGE, VOLUME 63 July, 1958, NUMBER 7

COAL AGE, with which are consolidated **The Colliery Engineer and Mines and Minerals**, is published monthly on the 1st with an additional Mining Guidebook number in Mid-July by McGraw-Hill Publishing Co., Inc., James H. McGraw (1860-1948) Founder. PUBLICATION OFFICE, Third & Hunting Park Ave., Philadelphia 40, Pa. See box below for directions regarding subscriptions and change of address.

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COAL AGE articles are indexed by Engineering Index. Coal Age's own index is published annually in the December issue.

SUBSCRIPTIONS: Send subscription correspondence and change of address to Fulfillment Manager, COAL AGE, 330 West 42d St., New York 36, N. Y. Subscribers should notify Fulfillment Manager promptly of any change of address, giving old as well as new address and including postal zone number, if any (official post office request). If possible, enclose an address label from a recent issue of the magazine. Since copies are addressed one to two issues in advance, please allow one month for change to become effective.

This Month in Mining Practice

BETTER BOLT ANCHORAGE—Proper anchorage is of course the secret in attaining proper tension and in turn maximum effectiveness in bolting. Not only must anchorage be good at the start, it should stay good as long as the support is needed. This then is the two-pronged problem. One answer recently introduced is cementing the anchor in place with quick-setting resin contained in a plastic envelope around the expansion shell. The objective is eliminating to a major degree a major variable in bolting practice.

AC AIDS—The rising AC trend is being accompanied by an expansion in the types of facilities available either for complete or partial changeovers from DC. Now, where DC will be continued for at least a time small AC power centers are being offered for certain auxiliary services, such as pumping. Advantages include fewer interruptions and motors that are much simpler from the maintenance standpoint. Thus, where complete conversion is impracticable, the new power centers make possible partial conversion on a profitable basis.

HUNDRED NEXT—The possibility of deep-mining equipment and methods achieving a cost under stripping is a continuing one. However, that possibility is not yet a probability except in rare instances. This is evidenced by the increasing size and cost of stripping units. Next on the docket is the 100-cu yd shovel—a jump of over 40% in one fell swoop. In other words, the differential in favor of stripping is still a real one and is likely to continue real for some time to come. But though underground methods are not normally likely to beat efficient stripping, they are nevertheless solidifying deep-mining's place.

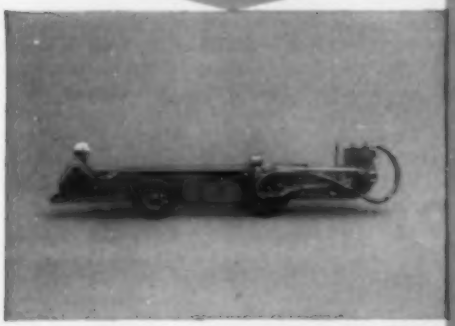
ULTRAFINE SCREENING—The rise of fine coal because of increased industrial demand and also changes in mining methods has, naturally, presented coal with both cleaning and sizing problems, not to mention dewatering. Advances in screen design as a result of more intensive research and development, however, are resulting in screens and screening methods that promise radical increases in efficiency with smaller and smaller coal. For instance, screening at ⅛ is relatively easy now at moistures under 4% and considerable work is being done to develop vibrating screens that will give the same dewatering results as centrifuges. Thus the operator with a fine-coal sizing problem can expect more and more help as time goes on.

AUTOMATIC TRIPS?—The experts in the business contend that the possibilities of automaticity and remote control are only being scratched, while the incentive still persists. For example, a man at a trip loading station two shifts a day means an outlay of $10,000 a year, or $50,000 a year in a mine operating five units. So, we have growing use of automatic trip-loading stations, overlapping cars and tone control and checking of fans, substations and so on. The future? More of both, including possibly operation of mine-car trips completely without men. It has been done at least once on a railroad commuter train.

FOR STATIONARY AIR COMPRESSOR USERS...

THE ACME JUMBOLTER

Model HSJ



FASTER AND EASIER!

Time studies have proven that under most mine conditions the ACME JUMBOLTER installs roof bolts 3 times faster than hand held machines.

LET THE MACHINE DO IT!

The ACME JUMBOLTER takes the heavy lifting and hauling out of roof bolting. Finger tip control positions the stoper at any desired point. Two stopers will cover any point in a space 23' 10" wide without moving the JUMBOLTER. Arms reach 9' in front of the machine and swing 270°. No blocking is required for uneven top. Ample space provided to carry the day's supplies.

The ACME JUMBOLTER was designed to furnish a quick and easy method of drilling Roof Bolt holes where a mine is equipped with stationary or semi-stationary air compressors and having air piped to the working face.

The unit is self propelled with full hydraulic drive and hydraulic steering. It is equipped with two Stoper Jumbo Arms and is complete with Stopers and Dust Collectors. Cleveland Model S12V Straight or Telescoping Leg Stopers or Model S20 Stopers may be used. All equipment is Bureau of Mines Approved. Best operating Conditions in seams 42" to 108" high.

We will demonstrate in YOUR mine. For more detailed information write or call —

ACME MACHINERY COMPANY

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WILLIAMSON, WEST VIRGINIA

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REPRESENTATIVES IN PRINCIPAL MINING AREAS

The Coal Commentator

Effective Standards

If coal was only consistent in makeup and mode of occurrence, life would be a lot simpler for producers, though perhaps more humdrum. But since coal does vary all over the lot in character and the way it occurs, the result is problems all along the line, including the development of standards for production.

The problem of how much a man or a machine should produce goes back to the earliest days of hand loading and, among other things, was responsible for "Committees of Inequality" in the 20s. Their job was to try to adjust hand-loading rates to varying conditions within and between producing regions. They achieved practically no success, incidentally. The problem still is a headache even in the era of continuous mining.

There is, of course, no practical way of fixing a standard that would apply to a number of operations. Very accurate and meaningful standards can, however, be developed for individual mines and units (see, for example, "Cost Control" in the April issue of *Coal Age*). **Their practicability can be judged by the ensuing savings, which run up to 25% or more of total mine cost.**

Big Prizes

Can coal come back as a transportation fuel? This question was prompted by the recent announcement that the *John Sherwin*, the new flagship of the Interlake Steamship Co. fleet, had loaded her first cargo at the Toledo docks of the C. & O. She is a coal burner and took her first fueling of 671 tons April 16.

Oil first knocked coal out of the bunkering field and then came on to knock it out of the railway field, the latter alone, at its peak, representing a market of nearly 140 million tons a year. So far, oil has had little difficulty fending off coal's attempts to get back, and the recent suspension of the development phase of the gas-turbine program postpones once again the day when an effective counterattack can be mounted.

But the marine and railway markets are really big prizes and there is no reason to believe that they cannot be recaptured. It may be a little later rather than sooner, but it can be done—if coal and its allies do not concede these prizes by default.

Golden Years

Many of the organizations serving the wide variety of industries in the United States for 50 yr or more have made significant contributions to coal-mining progress. Among these celebrating their golden anniversaries in 1958 are Thomas A. Edison Industries and the Commercial Testing & Engineering Co.

The Edison electric cap lamp is of course the major Edison contribution to efficiency and safety in coal mining. Though accepted and used as a matter of course, the electric cap lamp is an outstanding example of research, design and engineering.

Enjoying both national and international reputations, Commercial Testing & Engineering also has pioneered not only in coal testing and analysis, but in the development of standards for such testing, thus giving coal real help in areas where such help counts.

Orchids to both these organizations and best wishes for the next half-century.

No Letup

Dedication of the Shippingport Atomic Power Station May 26, with President Eisenhower participating, marked a milestone of sorts in the growth of nuclear power in the United States.

The dedication, however, did little to change the basic nuclear situation. Shippingport nuclear power is high-cost power—several times the cost of juice from coal-fired steam plants.

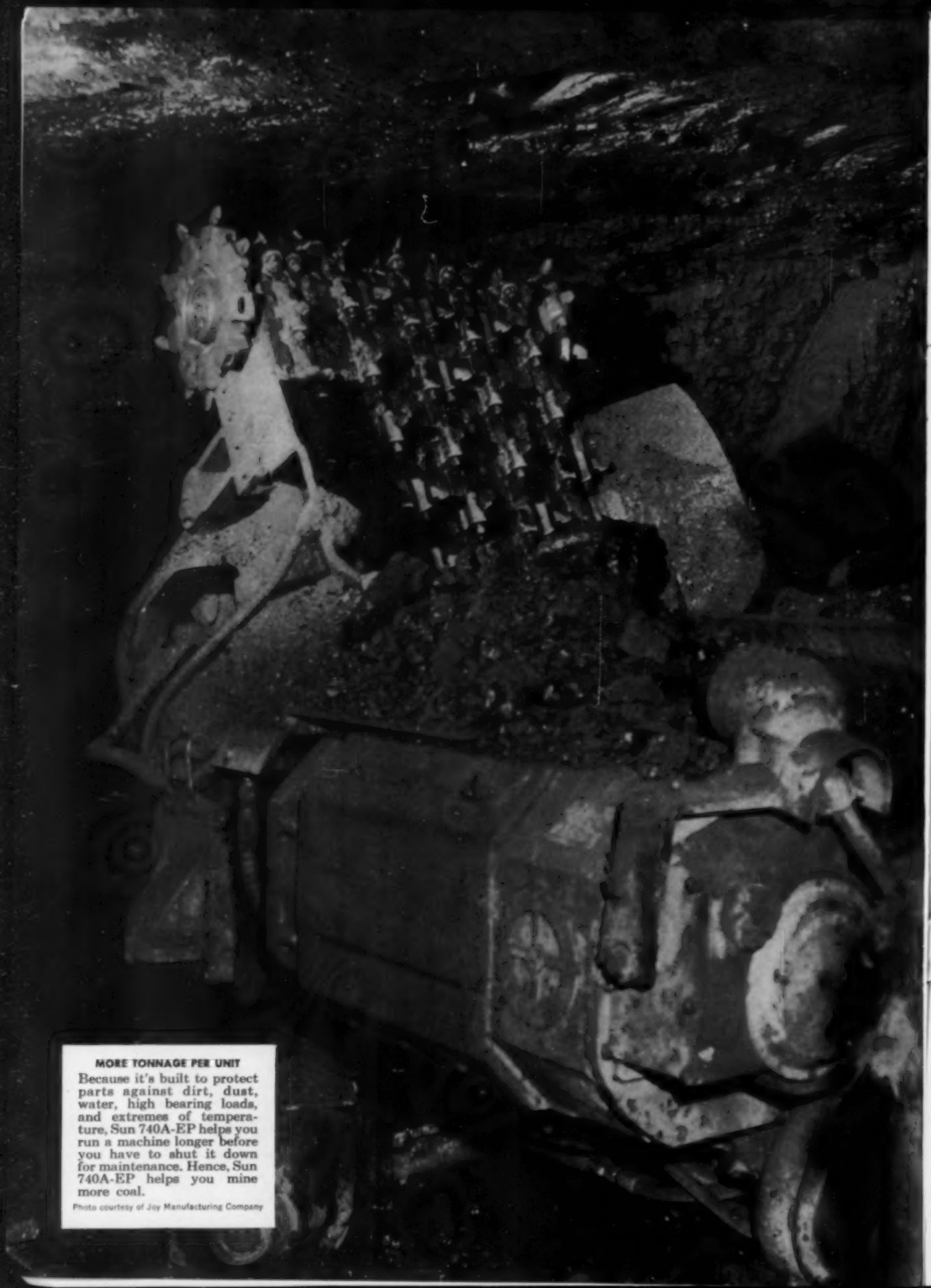
But this fact means nothing to the public-power advocates which comprise a fairly large and highly-vocal faction in Congress and elsewhere. They still are fighting tooth-and-nail to put the government into the power business via the nuclear route—or any other, for that matter—regardless of cost. In spite of administration opposition, they have made more progress than is comfortable.

So a big job for coal still is one of keeping the facts before Congress, the administration and the public.

Bigger and Better

The Southern Appalachian Industrial Exhibit, more popularly known as the Bluefield Coal Show, has shown steady and significant growth since the first in 1934. The 1958 show was no exception to the rule.

Modern equipment and materials have long been major ingredients in mining progress. The shows in Bluefield, and in Cleveland in alternate years, refocus attention on advances in machines and materials and thus serve as springboards for new starts in cutting cost, raising product quality and promoting safety. **Whether it be a method of cementing bolts in place, a new overburden drill, a heavy-media washer or a new methane detection and alarm system, all among the exhibits at Bluefield, the net effect is a step forward for coal.**



MORE TONNAGE PER UNIT

Because it's built to protect parts against dirt, dust, water, high bearing loads, and extremes of temperature, Sun 740A-EP helps you run a machine longer before you have to shut it down for maintenance. Hence, Sun 740A-EP helps you mine more coal.

Photo courtesy of Joy Manufacturing Company

SUN'S NEW 740A-EP GREASE HELPS YOU GET MORE TONNAGE

Sun's New Prestige® 740A-EP Grease is an all-purpose, semi-fluid, mine-machine lubricant. It pours readily, even at the lowest operating temperatures, and does not thin out excessively up to 200 F. It is water- and heat-resistant, has extreme-pressure properties, and gives excellent rust and corrosion protection.

When you use 740A-EP you . . .

- **mine more coal,** because you can run longer without shutdowns for inspection and maintenance.
- **cut operating costs,** because parts last longer.
- **simplify lubrication,** because you can use 740A-EP in place of two or three specialized lubricants.
- **use less grease,** because 740A-EP stays put.
- **increase safety,** because you get no excessive drippage. There's no need to worry about fire hazards and dangerous footing caused by gear oil slicks.

These days, when *every* miner is looking for ways to boost tonnage, but *not* his costs, a product like 740A-EP is especially interesting. Want to know the rest of the story? Call in your Sun man, or write to Dept. CA-7.

SUNOCO

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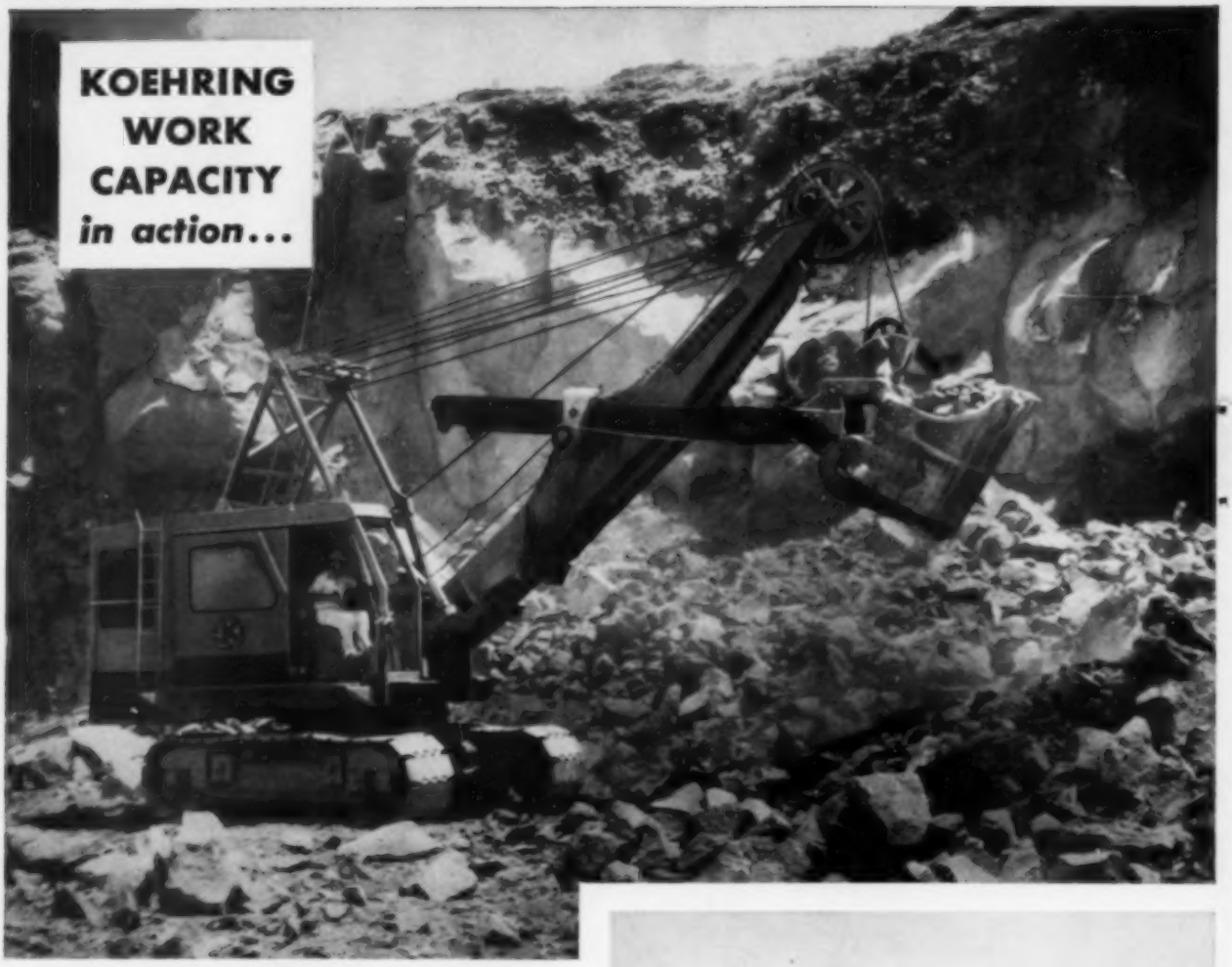
In Canada: Sun Oil Company Limited, Toronto and Montreal.

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY PHILADELPHIA 3, PA.

Sun Offices in coal country

City	Telephone
Brownsville, Pa.	State 5-7400
Chicago, Ill.	Harrison 7-2562
Cincinnati, Ohio	Garfield 3930
Columbus, Ohio	Broadway 4-1158
Greensburg, Pa.	Greensburg 5600
Huntington, West Va.	Huntington 9158
Indianapolis, Ind.	Humbolt 1354
Johnstown, Pa.	Johnstown 33-2111
Louisville, Ky.	Clay 5526
Pittsburgh, Pa.	Sterling 1-1252
St. Louis, Mo.	Chestnut 1-2191
Wheeling, West Va.	Warwood 148
Youngstown, Ohio	Sterling 8-5081



Heavy-duty rock shovel — Owner of this quarry used a Koehring® 1½-yard 605 to load out blasted rock. Powerful, 2-section chain crowd, and rugged digging strength of its deep-section boom and dual dipper sticks proved more than a match for the heavy rock. It's shown here with 22-foot boom, 16½-foot sticks — also available with 28-foot high-lift boom and 23-foot sticks. Strength and stability as a shovel increase the 605's work capacity with all attachments. For proof — check its lift rating in Koehring chart on opposite page.

Long-reach dragline — Here's a special size machine that fills a production gap on many operations — the Koehring 805. It handles 2 to 3-yard dragline bucket on 50 to 150-foot boom. Converts to clamshell, 52-ton lift crane, 2-yard shovel. Have Koehring distributor demonstrate what this big 805 will do on your stripping, stockpiling, lifting, loading.

KOEHRING DIVISION OF KOEHRING COMPANY, Milwaukee 16, Wis. . .

High-lift stripper — Look at the work range of this 1205 stripping shovel. When equipped with 3-yard dipper on 40-foot boom, it has a cutting height of 42 feet-10 inches, and dumps at 31 foot-5 inch height. That's with boom at 45° angle. Where extra reach is needed, you can use a 2½-yard dipper on 50-foot boom — and get 51 foot-4 inch cutting height, and 40 foot-10 inch dumping height, at a 45° boom angle. (For heaviest digging, a standard Koehring 1205 shovel has 3-yard dipper on 30-foot boom.) Depending on weight of materials, it also handles 3 to 4-yard dragline or clamshell buckets on 60 to 170-foot boom — details in chart below.

25-ton handyman — With its high speed mobility on rubber, Koehring 305 truck crane is a handy, heavy-duty material-handling rig around mines and quarries. Installs machinery, unloads heavy equipment and supplies — safely lifts up to 25 tons. Has full complement of clamshell, dragline, shovel or hoe attachments for all-round use.

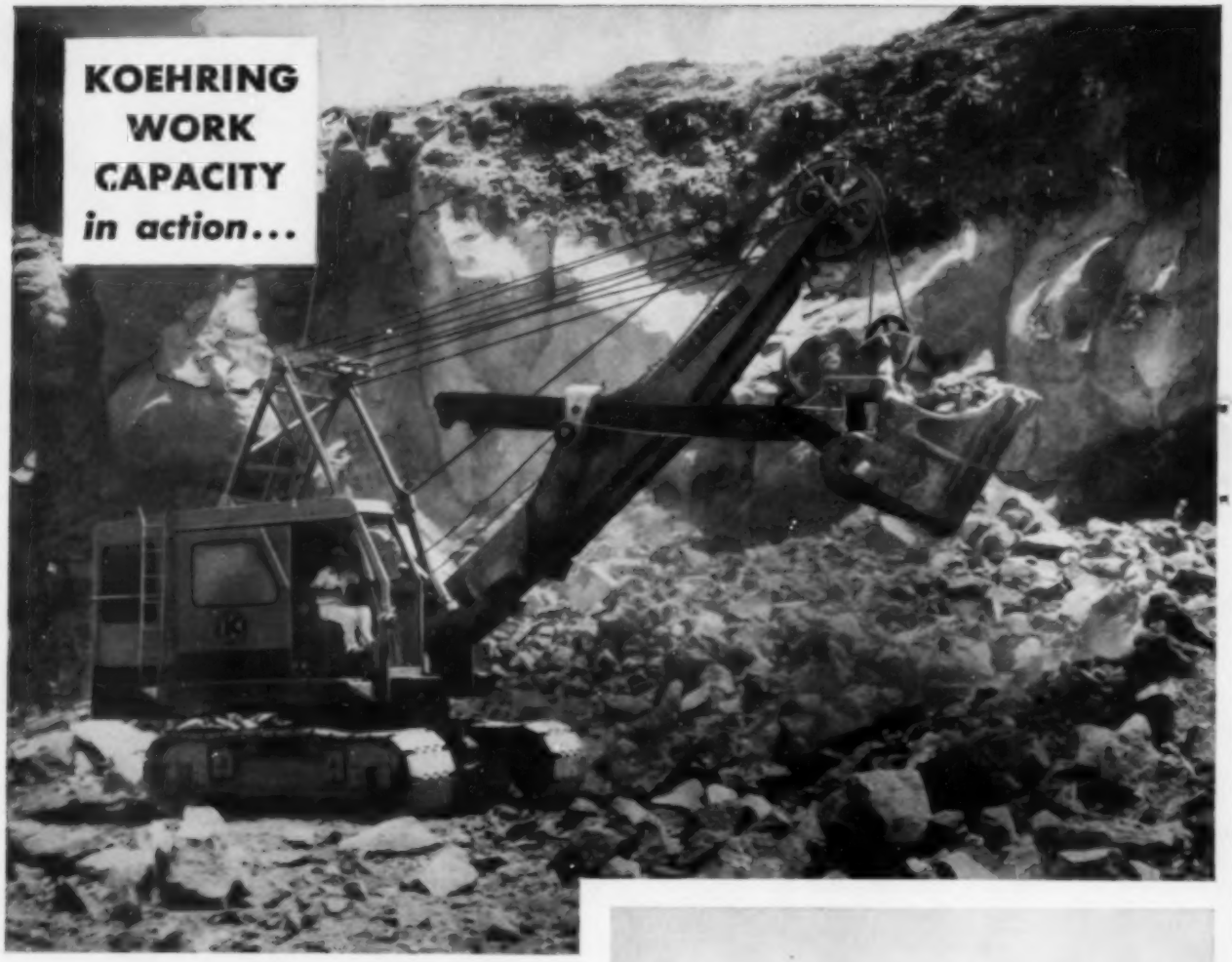
Quick facts on KOEHRING WORK CAPACITY:

MODEL	TYPE OF MOUNTING	CRANE LIFT CAPACITIES (Rubber-tired machines rated at 85% of tipping load.)	
ON RUBBER			
205	3-axle truck, or 21.5 mph Cruiser	30,000 lbs.	at 12-ft. radius
305	3-axle truck, or 18 mph Cruiser	50,000 lbs.	at 12-ft. radius
405	4-axle truck	70,000 lbs.	at 15-ft. radius
505	4-axle truck	90,000 lbs.	at 15-ft. radius
ON CRAWLERS	Size shovel	CRANE LIFT CAPACITIES (Crawler ratings based on 75% of tipping load.)	
205	½ Cu. Yd.	30,000 lbs.	at 10-ft. radius
305	¾ Cu. Yd.	50,000 lbs.	at 12-ft. radius
405	1 Cu. Yd.	68,000 lbs.	at 12-ft. radius
505	(Crane only—85% rating)	90,000 lbs.	at 12-ft. radius
605	1½ Cu. Yds.	72,200 lbs.	at 12-ft. radius
805	2 Cu. Yds.	104,200 lbs.	at 12-ft. radius
1205	3 Cu. Yds.	190,000 lbs.	at 12-ft. radius

Extra RH capacity means . . . MORE WORK CAPACITY WITH ALL ATTACHMENTS

Koehring excavators and cranes also manufactured in: CANADA • ENGLAND • SPAIN • JAPAN

KOEHRING WORK CAPACITY *in action...*



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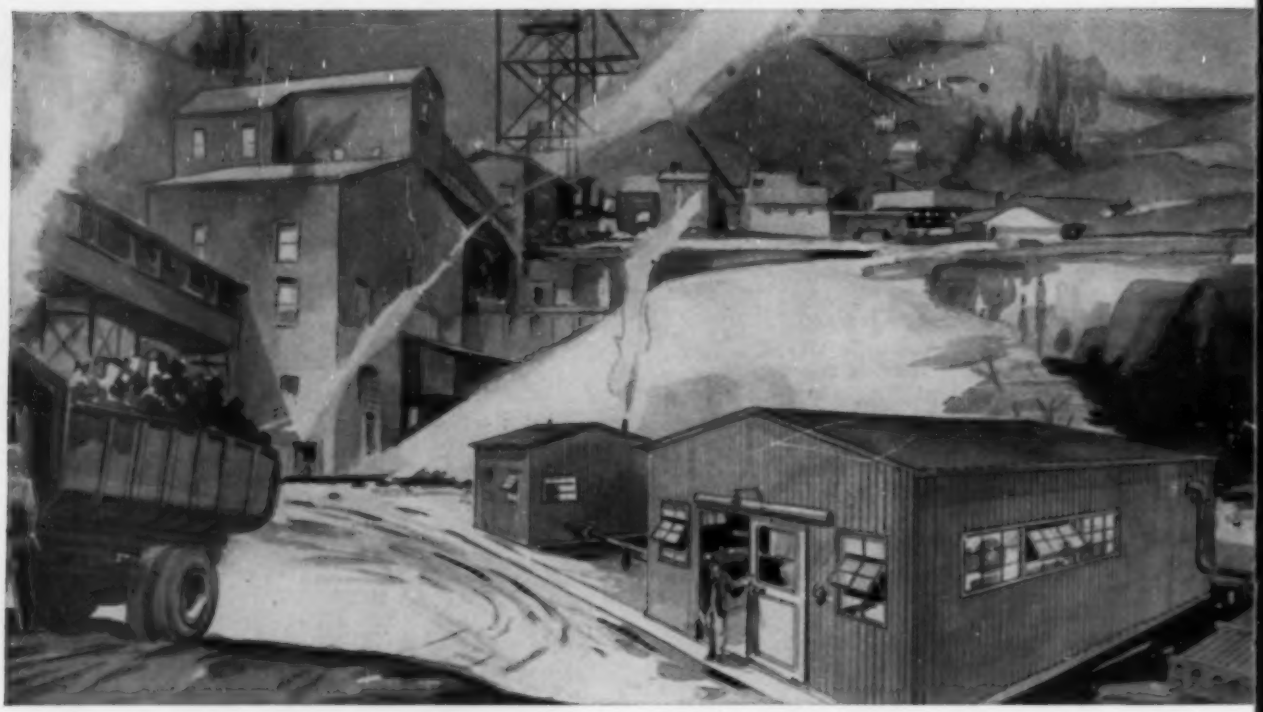
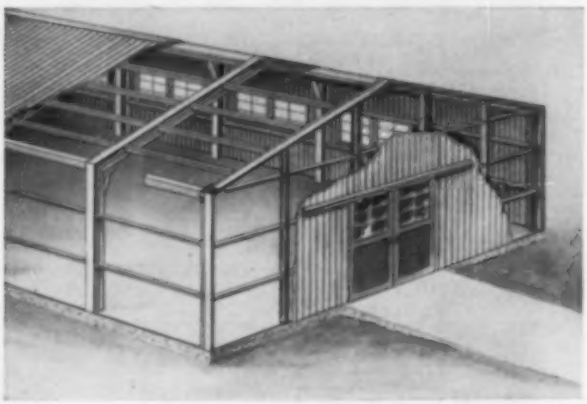


TRUSCON "Budget Buildings" meet mining demands at lowest possible cost



ENGINEERING DATA

Eave sections feature molded rubber closure between siding sheet and roofing sheet. Eave strut connection and bracing connection to rigid steel frame. Molded rubber closure also between ridge cap and roof sheet. Purlin connections to rigid steel frame. Girt connection to rigid steel frame. Standard steel bolts and nuts used for all connections. Rigid frame anchorage with curb angle is bolted to concrete footers. Steel doors of Truscon welded tubular construction in either swing or slide types and are complete with standard hardware. All steel windows are Truscon standard types, either fixed, pivoted, or commercial projected, and are complete with standard hardware. Doors and windows are bonderized and painted with one standard shop coat of gray rust inhibitive paint.

Top utility at lowest cost! That's the new Truscon Steel "Budget Building", designed to keep costs down and quality up. It is ideal housing for mine entrance operations . . . hoist houses, material and equipment shelter, personnel quarters, warehousing, storage, medical center, and field office applications.

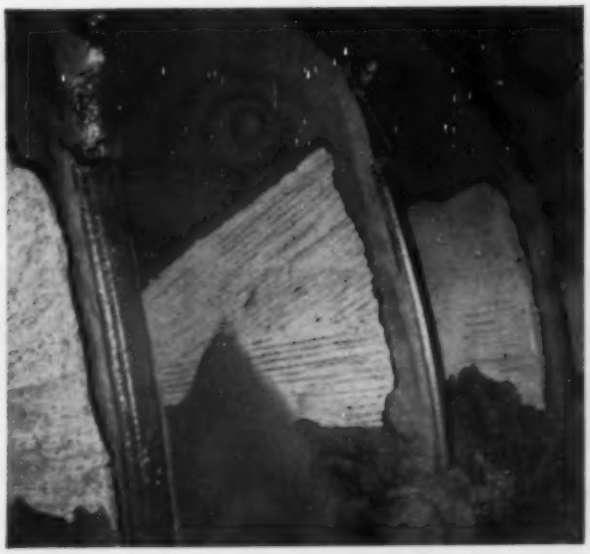
Truscon "Budget Buildings" are erected fast on your job site with three week delivery from date of your order.

Basic framework is of rigid frame design, shop fabricated from hot rolled structural sections, complete with all necessary connection plates and anchor bolts. Purlins and girts are cold formed channel sections, bolted with standard machine bolts.

Roofing and siding are 26-gage galvanized roll formed ribbed sheets 24" wide, and in continuous lengths. Sheets are rolled from Republic's tight-coated continuous hot dip galvanized steel . . . will not flake, crack, or peel. More rust resistant than ever and no painting needed.

Truscon "Budget Buildings" are available for immediate delivery in widths of 32, 36, 40, 44, and 48 feet —12- and 14-foot heights . . . in any lengths necessary. Orders are filled fast from "off-the-shelf" stocks of pre-engineered materials. All roofing, siding, windows, doors, and hardware are shipped to the job site as a package.

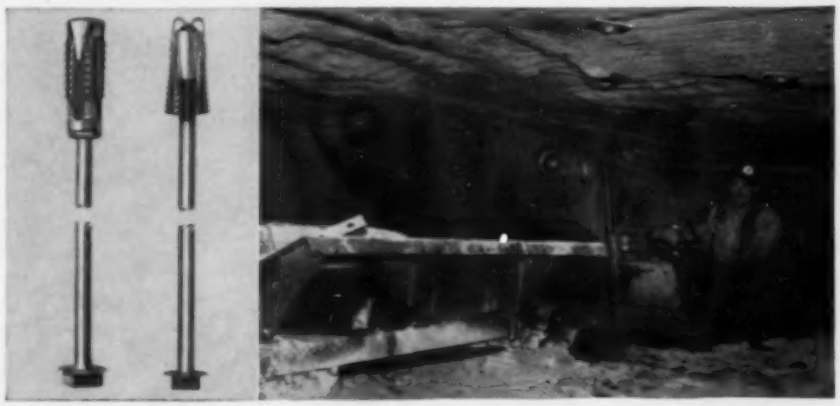
Learn more about Truscon "Budget Buildings". Send for attractive, full color brochure. Or, call your Republic-Truscon representative.



REPUBLIC STAINLESS STEEL OFFERS MINING ECONOMIES. Performance efficiency of this disc-type filter was increased two ways when cotton cloth was replaced by Republic ENDURO® Stainless Steel screen. First, much smaller fines were recovered. Second, intervals between filter replacement were extended many times. Republic ENDURO Stainless Steel is ideal for a wide variety of mining equipment applications. Send for data.

REPUBLIC PLASTIC PIPE SOLVES MINE CORROSION PROBLEMS. Corrosion-resisting performance of Republic Magnolia Flexible Plastic Pipe has solved expensive replacement problems in this mine-water handling system. At last report, Republic had outlasted conventional piping by six to one. Moreover, Magnolia Pipe is easier to install—and to relocate to meet changing needs. Send for details.

SPECIFY REPUBLIC MINE ROOF BOLTS. Get written proof of reliability—Mine Roof Bolt Material Control Certificate. Republic provides exact performance data because Republic controls quality from ore to finished product. Yield, break strengths are guaranteed to meet or exceed Specification ASTMA-306 as submitted by The Committee on Roof Action as mining standards. Republic offers all four major classifications of mine roof bolt assemblies. Types shown are square-head bolts. Unit on the left has RE-2 expansion shell, suited to relatively soft rock. Unit on the right has RE-3 for use in harder formations. Write today.



REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

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Please send additional information on the following:

☐ Truscon "Budget Buildings" ☐ ENDURO Stainless Steel
☐ Republic Mine Roof Bolts ☐ Magnolia Plastic Pipe

Name_____ Title_____

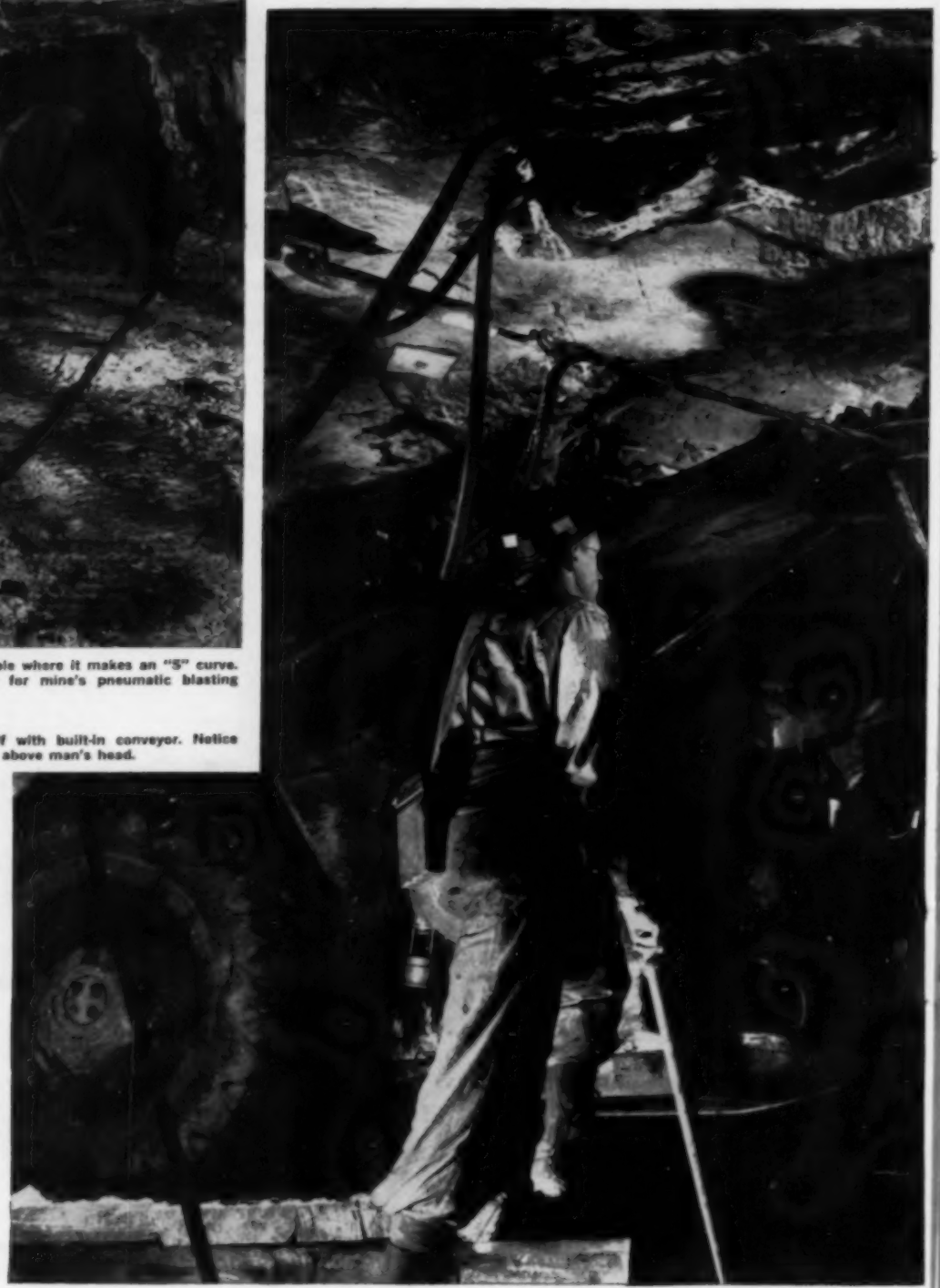
Firm_____

Address_____

City_____ Zone____ State_____

"We increased our cable life

Supervisor checks the cable where it makes an "S" curve. Thin tubing overhead is for mine's pneumatic blasting system.



Shuttle car unloads itself with built-in conveyor. Notice twisted Tiger Brand cable above man's head.

with TIGER BRAND,"

—*says Master Mechanic of a large Pennsylvania mine*

THE mine shown here is clean and modern, but it has just one purpose: to produce coal at a profit under safe working conditions. The mine has about 30 miles of trackway, and produces about 4,500 tons daily. About a dozen shuttle cars are in constant use, between rail heads and working faces that are frequently 100 to 200 yards apart.

The shuttle car electrical cable takes a terrific beating. The car often takes a circuitous route, and the cable is pulled tight around the corners of standing coal while it is reeled and unreeled without stop for the entire shift.

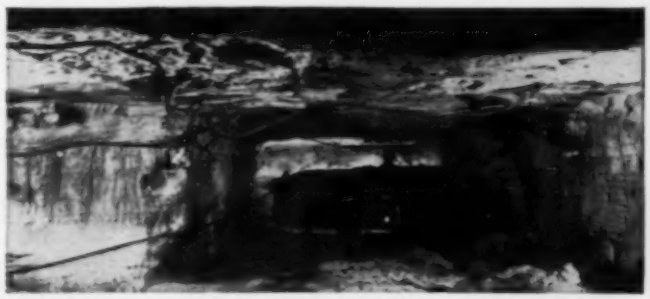
The Tiger Brand cable has outlasted the previous cable by a considerable margin. This is partly due to our "Bridgewall" construction, which actually puts a sheath of live jacket rubber around each conductor. Even when the cable is kinked or smashed, the conductors are protected by a thick wall of the toughest jacketing compound available in the industry.

The other factor that contributes to long trouble-free life is the dynamically balanced rope lay conductors. Concentric stranded wires of the ideal size—as opposed to loosely bunched groups of fine wires—are carefully prestressed to give balanced performance and freedom from unequal elongation between conductors.

Tiger Brand cable isn't cheap, but it's a good investment for any company that needs long, hard service. See your American Steel & Wire salesman.

Workman ties up cable. Spring-loaded strain reliefs are used when possible. Tape on cable prevents it from slipping through the relief.

Shuttle car makes return trip. Cable feed center is out of picture 100 yards or so to the left, near the rail head.



Tiger Brand Electrical Wire & Cable

a standard Tiger Brand cable for every special job!

Asbestos Wire and Cable • Mold Cured Portable Cord • Shovel & Dredge Cable • Paper & Lead Cable • Varnished Cambric Cable
Interlocked Armor Cable • Special Purpose Wire & Cable • Aerial, Underground and Submarine Cable

American Steel & Wire
Division of **United States Steel**

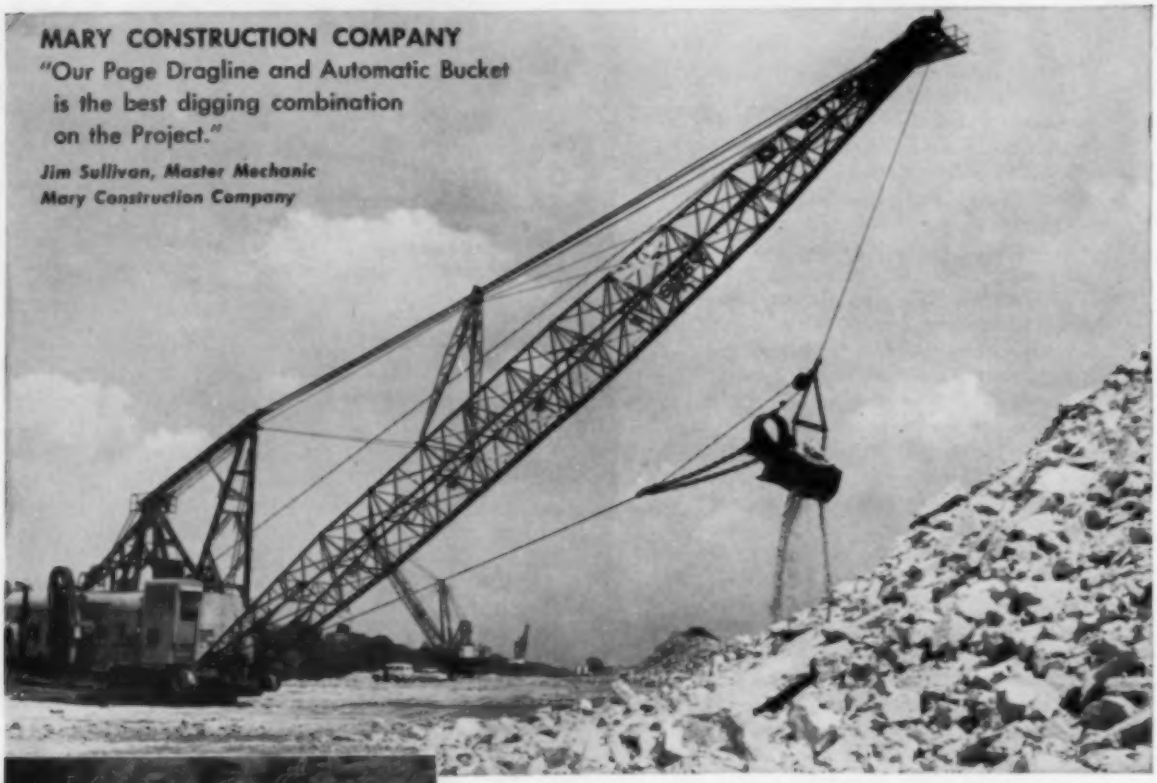
Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors • Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors • United States Steel Export Company, Distributors Abroad

What They're Saying About Page

MARY CONSTRUCTION COMPANY

"Our Page Dragline and Automatic Bucket is the best digging combination on the Project."

Jim Sullivan, Master Mechanic
Mary Construction Company



Digging under water, the Page Automatic's built-in automatic digging action gets a full rated load every time. This means higher production, more profitable operation.

When the Mary Construction Company, Cape Girardeau, Missouri, put its Page 723 Walking Dragline, equipped with a 9½ cubic yard Page Automatic Bucket to work on the Cal-Sag Project, they believed they had the right equipment for a tough job.

Now—after many months of operation under some of the most difficult digging conditions ever encountered on any job, they *know* their Page Dragline and Automatic Bucket is the best digging combination on the project.

The fast, tough, Page Walking Dragline, equipped with a powerful, specially designed and built Page V-6 Cylinder Horizontal Diesel engine, has proven to be very economical to operate, simple to maintain and extremely efficient on the job. The Page Automatic Bucket, designed for the hard, abrasive digging conditions of the project, is delivering maximum yardage on every swing and standing up to the bucket-wrecking stone and till exactly as expected.

Mary Construction Company's experience with Page equipment is typical the world over. Wherever there's tough stripping or digging of any kind to be done *at a profit*—you'll find Page Walking Draglines and Automatic Buckets at work.

WRITE FOR ILLUSTRATED CATALOGS ON PAGE

Equipment On The Cal-Sag Project

BADGETT MINE STRIPPING COMPANY
"For digging rock — and I mean BIG rock — nothing can equal our 14 cubic yard Page Automatic Dragline Bucket. She's designed for loading rock, and she really moves it."
"Slim" Tedders, General Superintendent, Badgett Mine Stripping Company

Here's a good example of the advantages gained by the user of a Page Automatic Bucket designed especially for the job. When the Badgett Mine Stripping Company needed a bucket to dig rock on their section of the Cal-Sag Project, Page engineers studied the problem, analyzed the type and size of material to be moved, and designed a dragline bucket that exactly met the requirements.

Special 14 cubic yard Page Automatic Dragline Bucket designed for digging large blasted rock under water.

SPECIFICATIONS AND ADVANTAGES:

WIDTH OF LIP . . . . 102"
Extra wide lip insures easy loading and dumping of large rock slabs . . . often over 8 ft. long and 4 ft. wide.

LENGTH OF BUCKET . . . . 130"
Longer bucket design for handling big, heavy stratified rock.

TAPER OF BASKET . . . . 6"; (108" to 102")
Taper from top to bottom and front to back assures fast, full loading action, clean dumping.

HEIGHT OF BASKET . . . . 55"
Relatively low basket design used, due to stacking characteristics of large rock. Better weight distribution, proper balance for handling rock.

SPECIAL USS "T-1" STEEL
Stronger, tougher alloy steel used for basket to add strength, resistance to abrasion and impact. Gives increased life, less maintenance.

If it's a PAGE... *It* DIGS

PAGE ENGINEERING COMPANY
Clearing Post Office, Chicago, Illinois

WALKING DRAGLINES AND AUTOMATIC BUCKETS

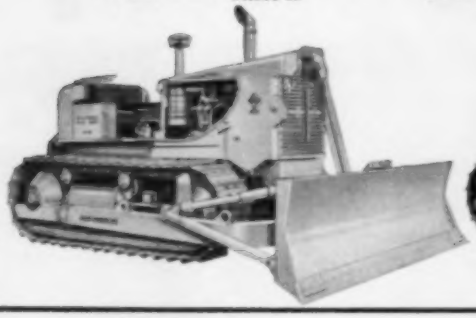
fastest growing acceptance in

Allis-Chalmers crawler tractors for every application

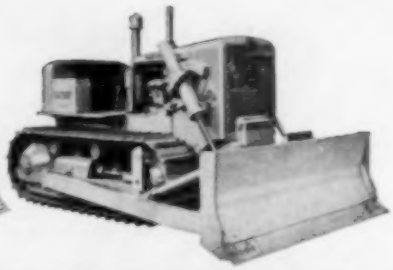
...plus a complete line of matched bulldozers, side booms, mounted rippers, other attachments.

*All weights approximately as illustrated. Twelve other tractor models available.

HD-21 225 net engine hp, torque converter drive, 56,260 lb*



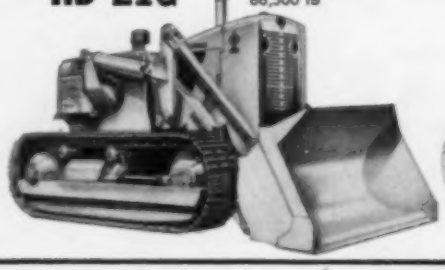
HD-16 torque converter drive, 150 net engine hp, 39,090 lb* | all-gear drive, 141 belt hp



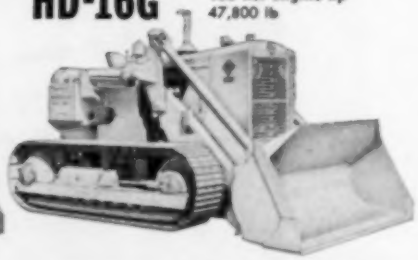
Allis-Chalmers tractor shovels in a full range of bucket sizes...

up to 7-cu-yd capacity to match requirements for various materials and job conditions.

4-CU-YD
HD-21G 225 net engine hp, 66,500 lb



3-CU-YD
HD-16G 150 net engine hp, 47,800 lb



Allis-Chalmers motor scrapers and wagons...

five models that offer major advantages on big jobs or utility work.

TS-360
280 hp
Struck — 15 yd
Heaped — 20 yd

TW-360
280 hp
Struck — 17 yd
Heaped — 24 yd

TR-260
200 hp
Struck — 11 yd
Heaped — 15 yd

Allis-Chalmers pull-type scrapers...

the only line with low bowl, high apron lift, forced ejection in every size.

model 315
Struck — 15 yd; Heaped — 20 yd

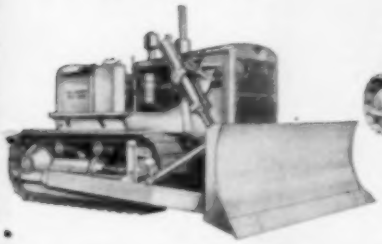
model 108
Struck — 8.4 yd
Heaped — 12 yd

model 106
Struck — 6.1 yd
Heaped — 8.5 yd

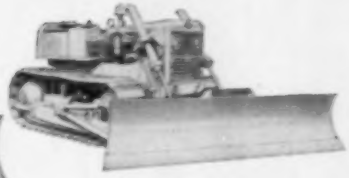
model 44
Struck — 4 yd
Heaped — 5.5 yd

the business . . . ALLIS-CHALMERS CONSTRUCTION MACHINERY

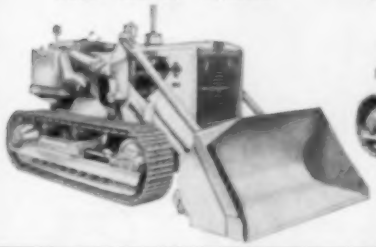
HD-11 94 belt hp 25,960 lb*



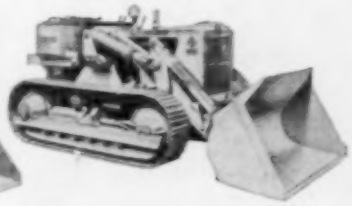
HD-6 63 belt hp 16,470 lb*

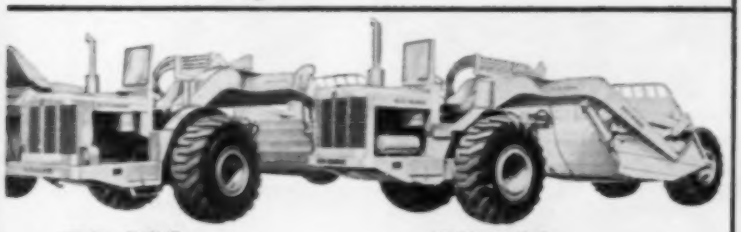


2¼-CU-YD
HD-11G 111 net engine hp 32,000 lb



1½-CU-YD
HD-6G 72 net engine hp 19,600 lb



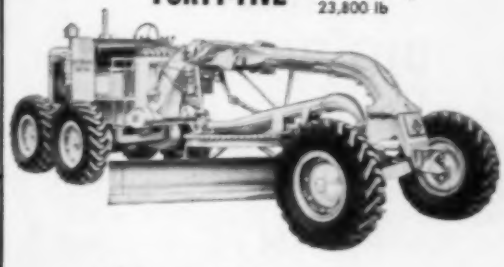


TS-260
200 hp
Struck — 11 yd
Heaped — 14 yd

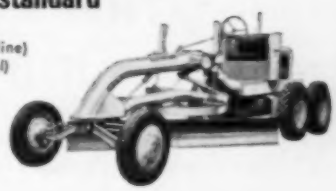
TS-160
155 hp
Struck — 7 yd
Heaped — 9½ yd

Allis-Chalmers motor graders...
designed for comfort-conscious operators and cost-conscious owners.

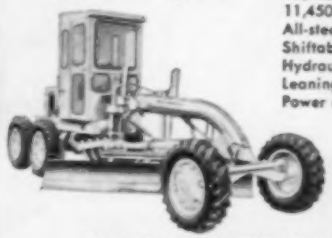
FORTY-FIVE 120 brake hp 23,800 lb



model D standard
50 brake hp
8,800 lb (gasoline)
9,350 lb (diesel)



model D special
50 brake hp
10,900 lb (gasoline)
11,450 lb (diesel)
All-steel cab
Shiftable moldboard
Hydraulic scarifier
Leaning front wheels
Power circle turn



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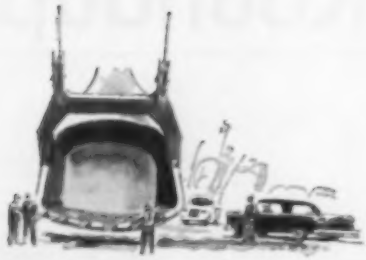
MILWAUKEE 1, WISCONSIN

DESIGNED AND BUILT FOR HIGH-VOLUME PERFORMANCE YOU CAN DEPEND ON

Look ahead... *move ahead*...and stay ahead with ALLIS-CHALMERS

LUBE PLAN HELPS BIG PAUL GET HIS TEETH INTO THE JOB

Big Paul, located near Freeburg, Illinois, was started up on Standard Oil lubricants. Shovel can take a 70-cubic-yard bite off the top of a 12-story building, move it a city block and deposit it atop a 10-story building.



Before Big Paul had taken his first 105-ton bite out of the overburden at Peabody Coal Company's River King mine, Standard Oil lubrication specialist Hervie Dillingham was there to help. A survey of the lubrication needs of this mightiest of all shovels was made and a program laid out for lubrication maintenance. The result is that Big Paul performs as expected every day, good weather or bad, hot or cold, wet or dry.

There are three reasons why, as far as lubrication is concerned, Big Paul is able to deliver this kind of performance:

1. The lube survey. This was a thorough run-down and analysis of equipment to be lubricated and the kind of lubricants that would do the job best. It had to be done by someone with experience in this kind of work.

2. The lubricating oils and greases. Protecting this important piece of equipment with the best possible lubricants is just good business. Peabody management men relied on Standard Oil products.

3. Experienced technical service. Standard's Hervie Dillingham has 20 years' experience providing lubrication technical service to mine operators. He knows mine equipment, the kind of conditions under which it operates, the best methods for maintaining it and the lubricants that will most economically and efficiently do the job.

You can get this kind of service on the lubrication of *your* mine equipment. Call the Standard Oil lubrication specialist nearest you anywhere in the 15 Midwest or Rocky Mountain states. Or write **Standard Oil Company, 910 South Michigan Ave., Chicago 80, Illinois**

YOU EXPECT MORE FROM STANDARD AND GET IT!

Standard's Hervie Dillingham calls on River King superintendent, Bob Harmon. Mine lubrication is a specialty of Hervie's. He has 20 years' experience in such work.

COAL AGE

News Roundup

The possibilities for rate reductions in the immediate future are slim; long-range hopes are firmer-based.

Federal Aid to Railroads: What Does It Mean to Coal?

PROSPECTS ARE DIM that across-the-board reductions in coal freight costs will follow Federal aid to railroads, McGraw-Hill's Washington Bureau reports. But informed industry analysts see possibilities of some eventual downward revision of rates as the financial burdens of the Nation's rail carriers are eased.

The railroad aid bill—passed by the Senate June 11—is due for quick House action. Major features of the bill, as passed by the Senate, include provisions granting $700 million in government-guaranteed loans and revising ICC authority over rates and service.

Summing up a roundup of Washington opinion, McGraw-Hill's Washington Bureau states:

"Washington observers see little hope for lower railroad freight rates in the current legislation before Congress. Congress is almost sure to vote a chunk of measures designed to aid the financial plight of the rails. But any real tampering with the Interstate Commerce Act to grant freedom in rate making seems to be pretty well ruled out.

"The Senate has been willing to go farther along this path than the House. But observers don't look for either side of the legislative body to end up with a major change in the present rate-making procedures.

"It is a pretty moot point with the coal industry anyway. Rate-cutting freedom that the rails want, and the Senate approved, is aimed at low-volume, high-cost shipments where truck and rail competition is the strongest."

Informed coal-industry analysts put the case for eventual downward revision of freight rates on this main premise: Smart business planning calls for action to stem the trend away from rail transport.

Coal freight revenue, exceeding $1 billion annually, is by far the biggest single source of income to the railroads. A constant succession of rate increases, however, has caused coal to divert tonnage to river barges and to aggressively promote new methods of transport such as pipelines and long-distance transmission of coal-energy by wire.

Rail carriers have argued that capital needs and rising maintenance, equipment and labor costs have justified all their rate increases. In the background, too, but generally denied by the carriers, are cumbersome passenger deficits that many claim are written off through freight revenue.

The upshot: With financial burdens eased by federal aid, some coal-industry analysts figure the rail carriers should eventually find themselves in a better position to recover and build business through a downward revision of rates. Even without federal aid, some railroads have already taken or considered this tack, notably, the Illinois Central and the C.B.&Q. (*Coal Age*, November, 1957, p 138); the L&N, (*Coal Age*, October, 1957, p 162); and the Southern Railway (*Coal Age*, June, 1958, p 58).

In proposing rate cuts on coal to the Carolinas the Southern and Pocahontas roads point out that a number of conversions from coal to other fuels are taking place. Reduced rates on fine coal also are sought to meet the threat that power will be produced at the mines and transmitted to these areas, thus bypassing the railroads in transporting the energy.

In This Section

People in Coal	p 32
Current Coal Patents	p 36
New Books	p 38
Coal Abroad	p 44
Mines and Companies	p 50
Associations	p 50
Preparation Facilities	p 54
Equipment Approvals	p 56

Princess Elkhorn Scholarships Won

Princess Elkhorn Coal Co., David, Ky., has announced recipients of its 14th annual scholarship awards.

This year's five winners bring to 60 the number of grants made to outstanding graduating seniors in Floyd and Johnson Counties, Ky.

The 1958 Princess Elkhorn awards

A smart hunter knows this sign means deer...

A smart bearing buyer knows this sign means value...

TIMKEN®

SMART bearing buyers know the trade-mark "Timken" on a product means they get the greatest value for their money. It's a registered trade-mark identifying tapered roller bearings, fine alloy steel bars, seamless steel tubing and removable rock bits, products that are made by The Timken Roller Bearing Company.

And the name "Timken" stands for highest quality. Quality that industry knows and wants. Quality with a backing of 59 years' experience, safeguarded at every step from melt of steel to finished product.

It will pay you to remember that "Timken" is a trade-mark, not just a type of product. If you're looking for the best, look for the trade-mark "Timken". It's your assurance of getting the highest value. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TAPERED ROLLER BEARINGS • REMOVABLE ROCK BITS • FINE ALLOY STEEL

Works better with less work...

Reed Wins Old Timers' Award

CHARLES ALAN REED, Drift, Ky., recent graduate in mining engineering from the University of Kentucky, receives a gold watch for his outstanding collegiate record from S. M. Cassidy, vice president, Consolidation Coal Co. The award by the Old Timers' Club is limited to seniors who plan to enter the coal-mining industry. Others in the photo above are Mrs. C. A. Reed, and the award winner's parents, Mr. and Mrs. Ward L. Reed. The Reeds operate coal mines at Drift. Mr. Reed received his bachelor's degree at university commencement exercises on May 26. Mr. Cassidy was himself honored by the University of Kentucky, his Alma Mater, with the degree of Doctor of Science, in recognition of his outstanding contribution to coal-mining engineering and administration throughout his career in the industry.

Queen Bituminous Opens Bluefield Show

PEGGY LEE TOLLEY, Mullens, W. Va., daughter of Andrew J. Tolley, foreman at Tralee mine, Semet-Solvay Div., Allied Chemical & Dye Corp., and Mrs. Tolley, officially opens the biennial Bluefield Coal Show, May 22. Surrounded by her court and assisted by Coal Show and civic officials, Miss Tolley snips the ribbon to admit the first visitors to the 3-day exhibition of mining equipment. More than 325 manufacturers, exhibitors and service agencies exhibited at the show. Miss Tolley's attendants are Carol Todd, Coalwood; Nancy Hughes, Pageton; Sarita Matney, Baileysville, and Wanda Lou Stout, Bluefield. A review of equipment shown at Bluefield begins on p 122.

(Continued from p 26)

were won by the following students:

Larry D. Wilson, son of Mr. and Mrs. Thomas D. Wilson, of Auxier; 4-yr grant for the study of engineering at University of Kentucky.

Charles L. Mills, son of Mr. and Mrs. Luther Mills, Paintsville; 4-yr grant for the study of engineering at University of Kentucky.

Linda Sue Preston, daughter of Mr. & Mrs. E. Jay Preston, Williamsport; 4-yr grant at Pikeville College to prepare for a teaching career.

Deanna Garrett, daughter of Mr. & Mr Amram Garrett, Lancer; 4-yr grant at Pikeville College to prepare for teaching.

Raymond Wells, son of Mr. & Mrs. Ernest Wells, Emma, Ky.; 4-yr grant to the school of his choice for a pre-medical course.

The five recipients of the awards are sons and daughters of employees of Princess Elkhorn Coal Co., at David, with the exception of Mr. Wells, whose father is mine foreman for Stephens Elkhorn Fuel Corp., Manton, Ky. The scholarship committee chose the five winners from among 44 seniors representing 12 high schools in Floyd and Johnson Counties.

During the past year, 11 students attended college with assistance from Princess Elkhorn. Five were at Pikeville, one at Berea College and five at University of Kentucky. One young man graduated from Pikeville this year with a degree in secondary education.

Up Minimum Wage

Examiner recommends increase on basis of Walsh-Healy Act.

An increase of 50c in the minimum hourly wages to be paid in the bituminous coal-mining industry, to employees engaged in the performance of contracts with agencies of the Federal government, pursuant to the Walsh-Healy Public Contracts Act, has been recommended by a hearing examiner of the Dept. of Labor. The 50c per hr increase applies in all producing districts, other than Districts 12 and 21. In the latter districts, the minimum rate set in 1955 would continue. The new increase is based upon prevailing wages paid in each district, as set down in the national bituminous wage agreement of Oct. 1, 1956.

Minimum hourly wage recommended by the examiner for each producing district in the industry is as follows:

Dists. 1, 2, 3, 4, 6, 7, 8 and 10—$2.745; Dists. 9, 14 and 15—$2.59; Dist. 11—

(Continued on p 46)

Works better with less work...

The LONG Lo-Rope BELT CONVEYOR

Easier, faster to assemble!

Easier, faster to move!

Easier, faster to extend!

Easier, faster to operate!

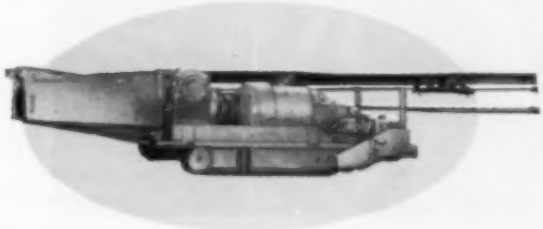
Patents Pending

And it's easy to intersperse LONG Lo-Rope structure with your existing rigid structure and terminals

With its entirely different design, the LONG Lo-Rope offers a number of important operating and safety features not previously available.

For example—in this construction, the wire rope is located below the carrying belt and carrying idlers. The idlers rock (not swing) in the direction of belt travel, thus providing automatic self-training of the belt in both directions. Adjustable height platform rocker support stands minimize blocking and level belt automatically. The deep troughing angle (27°) reduces spillage and permits wider spacing of idlers. There are no side obstructions at carrying belt level, so handling men and supplies is easier and much safer. And with the Lo-Rope, maximum head room is assured as carrying surface of belt may be as low as 9" from the mine floor.

For details on the Lo-Rope Belt Conveyor, write us today. Or better yet, install a test section of Lo-Rope the next time you make a belt extension and learn first hand why it works better with less work.



LONG Belt Conveyor Mobile Drive Units

Self-tramming for easy moves. Available in units up to 40 HP with either snub or tandem drive units for use with Lo-Rope or any other type of belt conveyor.

The LONG Company
Oak Hill, W. Va.

Now! You can run up your profit on a couple of feet, too!

NEW! ANOTHER FIRST!

Compton "Triple Head"

COAL AUGER

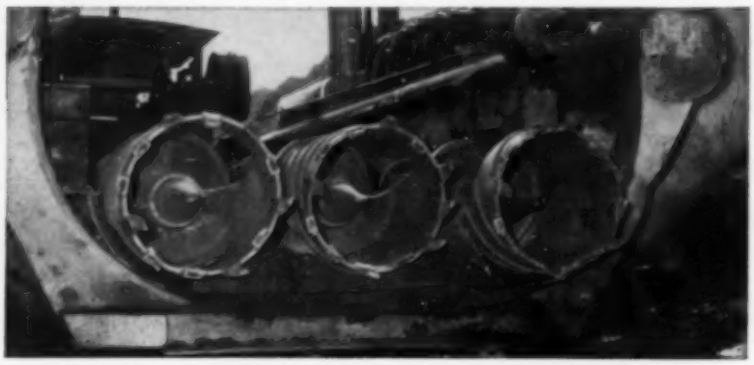
. . . for seams as thin as 24"

DRILLS TO A DEPTH OF 200 FEET

■ The Compton "Triple Head" Coal Auger is designed to answer your needs for a profitable way to recover coal from seams as thin as 24". No need now to by-pass thin seam coal . . . to pass up new development areas. The new Compton "Triple Head" can step in and deliver tonnage that will add up to plus profits for your mining operation.

■ The triple heads revolve in unison and auger a single row of three holes or, where seam thickness increases, a double row of overlapping holes can be drilled up to a depth of 200 feet.

12% More Coal Recovery with COMPTON "Triple Head" Coal Augers!



The Compton "Triple Head" produces 58 tons of clean, saleable coal per hour from 24" seams.

For a free appraisal of your property and auger requirements, call Compton today!

Compton, Inc.

CLARKSBURG, WEST VIRGINIA

WHEN LOOKING FOR AUGERS — LOOK TO COMPTON

No. 7 in a series

Right off the Wire

An application of television shows a pilot the image of his plane superimposed on a map of the territory over which he is flying.

An X-ray inspection method for solid cast rocket fuels reveals any cavities or fissures that would interfere with burning.

A new machine at Simplex applies Condex Interlocked Armor over cable cores having diameters up to 4.5".

An electronic guidance system will help river pilots to maneuver long strings of barges around the bends and under the bridges of the Mississippi.

A new facility for advanced research in thermonuclear reactions is expected to generate temperatures in the millions of degrees.

A land-mine exploder has been developed by the Army which will detonate buried explosives without damage to the exploder or the tank that carries it.

A new alkaline flashlight battery is said to last ten times as long as ordinary dry cells and to deliver more power.

A generator-powered flash-bulb holder is about the size of an electric razor. Half a turn of a wheel stores enough electricity in a capacitor to fire the bulb.

A television tube only five inches thick has been developed in England.

A process has been developed for electroplating copper on aluminum. The plating can be tinned, soldered or formed.

A new synthetic rubber is resistant to oils, fuels and solvents and retains its properties at temperatures as high as 400°F.

A new chemical compound slows the growth of any part of a tree without affecting the rest.

A new electronic instrument analyzes the sequence of chemical reactions in the burning of rocket fuels in one ten-thousandth of a second.

A single relay system across Canada from Halifax to Victoria will carry television programs and telephone conversations.

The floodlights at Niagara Falls have been redesigned to give ten times the illumination of the former twenty-five-year-old system with no increase in power consumption.

Further information on these news items and on Simplex cable is available from any Simplex office. Please be specific in your requests.

Among the United States exhibits at Brussels will be an outline of world history for the entire Christian era stored in a computer. Any item can be found in two-thirds of a second and printed in any one of ten languages.

The first digital computer fast enough to evaluate the performance of a missile in flight is said to be twenty-four times faster than preceding models.

A new X-ray technique reduces radiation exposure to a fraction of that now used for diagnosis.

A new truck transmission has twelve speeds in one gear box controlled by one lever.

A new machine can weigh and sort coins at the rate of 18,000 per hour with an accuracy of plus or minus one-fourth of one per cent.

A new desk-top machine covers one or both sides of documents with clear plastic film.

A device for practice in marksmanship shoots, instead of a bullet, a flash of light, which shows on the target.

An ultra-sensitive space speedometer measures acceleration in any direction.

A Simplex Laboratory

At the Simplex plant in Cambridge, six modern, well-equipped laboratories similar to the one shown here are devoted to the never-ending search for new, better materials and methods which result in new, better wire and cable products. Over the years, this program of concentrated, intensive research has brought about a great number of the most important technical advances and product improvements that have made Simplex the leader in the wire and cable industry.

SIMPLEX WIRE & CABLE CO.
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Newington, New Hampshire

Simplex

Highest quality cables for: Mining
Power & Lighting • Construction
Transportation • Communications
Signalling

"The American manufacturers of transoceanic telephone cables"

People in Coal

Frank Kolbe Heads NCA

FRANK F. KOLBE, president, United Electric Coal Cos., Chicago, Ill., has been elected president of the National Coal Association, succeeding L. Newton Thomas, president, Carbon Fuel Co., Charleston, W. Va. Mr. Kolbe became a director of United Electric Coal Cos. in 1935 and was elected president of the company in 1939.

One of the highlights of his career in coal has been the development of the Kolbe wheel excavator, a machine which removes from 30 to 40 ft of the top overburden in strip mining and deposits the spoil approximately 400 ft away from the point of pickup. Economical stripping of deeper coal results.

Mr. Kolbe is a native of Ann Arbor, Mich., and holds bachelor's and master's degrees in economics from the University of Michigan. He taught economics for 3 yr at Michigan, and shortly thereafter joined General Motors Corp. He spent 9 yr with General Motors, six as assistant treasurer. One of his colleagues, also an assistant treasurer, was Robert R. Young, later to become head of the Allegheny Corp. and the C&O.

Then for 10 yr Mr. Kolbe was active in private investment trusts and holding companies—half of that time in partnership with Mr. Young under the name of Young, Kolbe & Co., members of the New York Stock Exchange. He was also president of Pathé Film Corp. for 2 yr. He was chairman of the team of American coal experts who visited Poland in 1957.

C. W. "Bill" Davis, secretary of the Big Sandy-Elkhorn Coal Operators Association since 1952, has been appointed executive secretary of the Bituminous Coal Operators Association, Washington, D. C., according to an announcement by Edward G. Fox, president of BCOA. Mr. Davis succeeds D. W. Cannon, who resigned recently to join the staff of the National Association of Manufacturers in New York. Mr. Davis is a graduate of the University of Tennessee.

Charles B. Tillson Jr., formerly general superintendent of Crucible Steel Co. of America coal mines has been named assistant manager of the company's Fuel Division, according to an announcement by G. E. Muns, manager of the division. A graduate of Lehigh University, Mr. Tillson joined Crucible in 1952 as assistant superintendent at Crucible, Pa., mine, after 15 yr service with Bethlehem Mines Corp. Mr. Tillson's headquarters now will be at Pittsburgh.

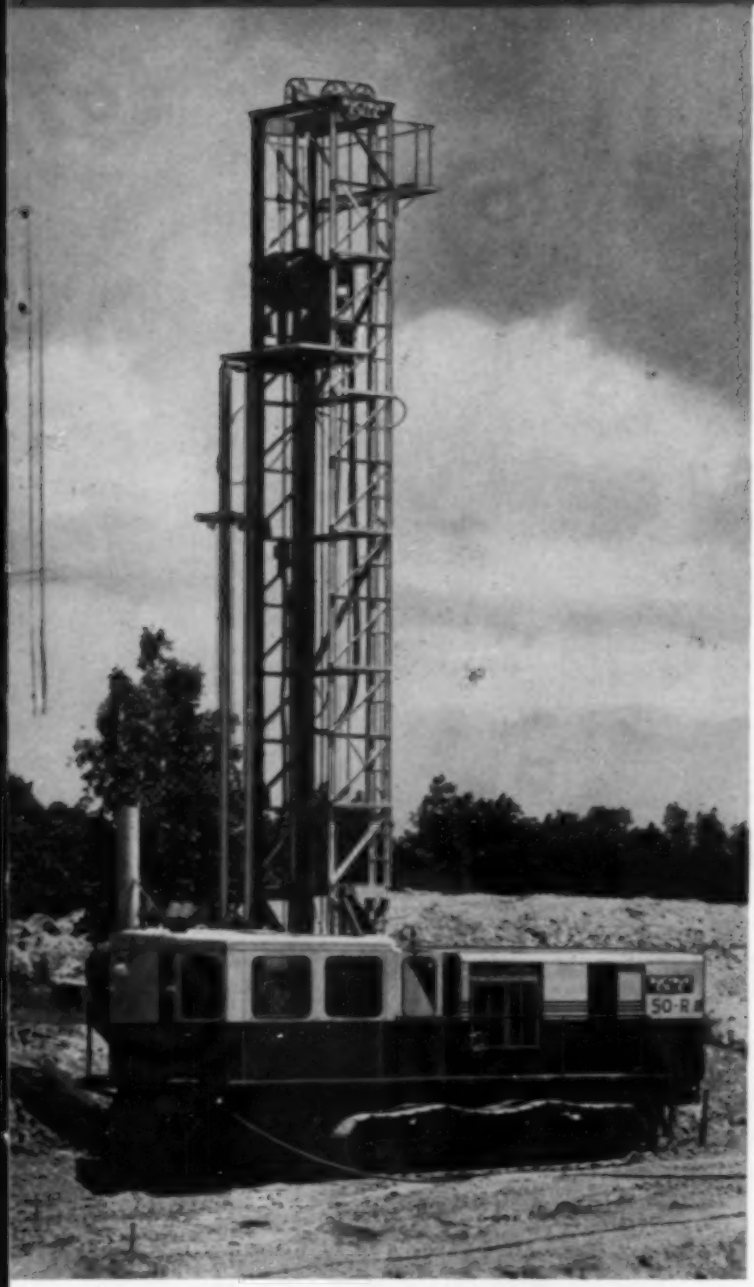
John S. Routh Jr. has been named executive vice president and a director of the Pittston Co., New York, N. Y., having advanced from the position of executive vice president of the Pittston-Clinchfield Coal Sales Co., a subsidiary. **Joseph T. Berta** was elected senior vice president and a director of the parent company and **Carlos J. Routh** was named vice president for finance. Mr. Berta continues as president of Pittston-Clinchfield. The two new directors succeed **John S. Routh Sr.** and **Joseph L. Schroeder,** who have resigned. The former is the father of John S. Routh Jr. and Carlos J. Routh.

French Workman announces his retirement July 1 as general manager of mines for Lorado Coal Mining Co., Lorado, W. Va., after more than 41 yr service. **Timothy L. Johnson** has assumed the responsibilities of operating assistant to the president and will have charge of the Lorado operations in addition to other duties. **John W. Straton,** recently appointed general superintendent, will be directly responsible for supervision of the various departments at Larado.

Mr. Workman, a native of Jesse, W. Va., began his mining career at the age of 15 with McAlpin Coal Mining Co. He joined Lorado in 1916 as the property was opened and advanced steadily until he became general manager in 1946. He has played an important role in the planning, development and management of the company's new mines, preparation plants and methods over the years, including the change from hand loading to full mechanization.

Dr. Charles J. Potter, president, Rochester & Pittsburgh Coal Co., Indiana, Pa., has been elected to the board of directors of the Vitro Corp. of America, miners of uranium and other minerals. A director of a number of other companies and of the American Mining

BUCYRUS-ERIE ROTARIES Speed Blast Hole Drilling



A new drilling record was established at this large open pit coal mine in Indiana when the 50-R shown here was put into operation.

BUCYRUS-ERIE rotaries are increasing drilling footage at open pit mines everywhere. Their ability to put down hole fast results from an exclusive combination of features — variable drilling speed and variable down pressure.

For controlled speed, the Ward Leonard variable voltage system gives the operator smooth, instant command over rotation of the drill pipe. He can choose the most efficient speed for a given formation. To meet requirements, he can vary the speed without stopping the drilling operation.

In hard formations, maximum down pressure can be exerted on the bit while the drill pipe is turning slowly. This gives greatest possible penetration.

In soft formations, the operator can increase rotating speed substantially as he cuts down pressure. He can match pulldown force and rotation speed so tools do not advance faster than cuttings are removed. At the same time he keeps up enough air velocity to remove cuttings from the hole.

For the full story on Bucyrus-Erie rotaries, contact Bucyrus-Erie Company, South Milwaukee, Wis. Ask for illustrated bulletins on the 50-R (full-electric rig for drilling 9⅞ to 12¼-in. holes) and the 40-R (diesel or electric rig for drilling 6¾ to 9-in. holes).

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A Familiar Sign at Scenes of Progress

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN

Will your shovel keep on working when its

CABLE'S ON THE ROCKS?

When the going is soft, *any* shovel cable may do. But the going is more often rough than easy—and not all shovel cables perform alike! They are not made alike.

Anaconda SH-D Shovel Cable, for example, is made by people who know mining problems firsthand—we're miners ourselves.

The insulation is a special high-grade butyl that withstands ozone, heat and moisture. Patented rubber cores cushion the ground wires and help prevent breaks from kinks and runovers. The neoprene jacket is extremely tough and abrasion-resistant. Every design and component has been job-tested under the most difficult conditions.

Why not call on the especially qualified Man from Anaconda to help with your cable problem? Or see your local Anaconda distributor. For new descriptive Bulletin DM-5818, "Anaconda Securityflex Portable Cables for the Mining Industry," write: Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

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ASK YOUR **ANACONDA®** DISTRIBUTOR FOR **SHOVEL CABLE**

People in Coal *(Continued)*

Congress, Dr. Potter also is an advisor to President Eisenhower's Cabinet Committee on Energy Supplies and Resources.

Old Ben Coal Corp., Chicago, Ill., has announced the decision of **Howard Lewis,** vice president in charge of production, to retire on June 30 after 38 yr service with the company. During these years Mr. Lewis advanced through the positions of motor boss, assistant mine manager, mine manager and general underground superintendent to the vice presidency of the company. In doing so, he established an enviable reputation for mining knowledge and executive ability. **George A. Strunck,** formerly superintendent of plants at Old Ben, has been named to succeed Mr. Lewis, effective July 1. **William C. Campbell,** who had been assistant to Mr. Lewis, was transferred to Chicago from the West Frankfort, Ill., headquarters to become assistant to the president, D. W. Buchanan Jr.

J. K. Taggart, executive vice president, and **R. E. Howe,** secretary-treasurer, Appalachian Coals, Inc., Cincinnati, Ohio, retired June 1 after long terms of service with the world's largest coal marketing agency. Successor to Mr. Taggart as executive vice president is **V. M. Johnston,** formerly controller of ACI. **Ralph Laughlin,** manager of accounting and statistical department, was named treasurer, and **C. R. Treyens,** sales assistant, becomes secretary. **Goodwyn Holmes,** general manager of sales, was named a vice president of ACI.

Victor R. Jones, formerly superintendent of the Windsor Power House mine, West Penn Power Co., has been named superintendent of Allegheny Pittsburgh Coal Co., New Kensington, Pa., a West Penn affiliate. Mr. Jones joined Windsor in 1920 as an engineer, transferred to Allegheny Pittsburgh in 1924 and returned to Windsor, in 1936.

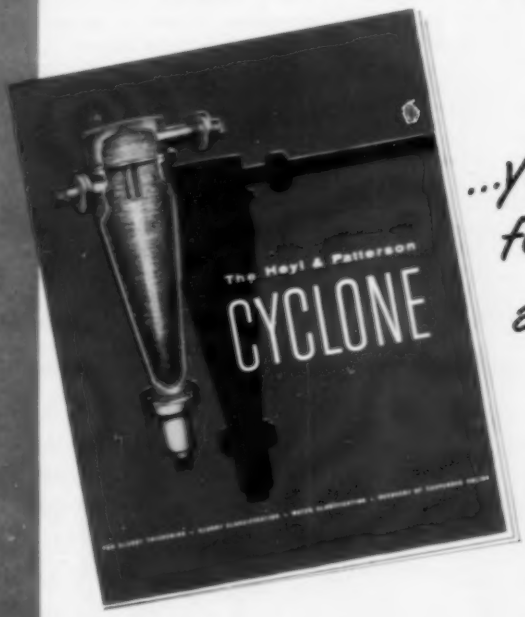
John M. Hackett, formerly maintenance engineer, Allegheny Pittsburgh Coal Co., has been promoted to succeed Mr. Jones as superintendent at Windsor Power House mine. Mr. Hackett is a graduate of Pennsylvania State University. He joined Allegheny Pittsburgh in 1941, became safety engineer in 1946 and maintenance engineer in 1955.

G. A. Shoemaker, executive vice president of Consolidation Coal Co., Pittsburgh, has been reelected to his eighth consecutive term as president of the Western Pennsylvania Coal Operators Association. **Harry A. Suter** was named to his eleventh term as executive vice president of the association, and **Charles B. Baton,** Greensburg-Connellsville Coal & Coke, is vice president.

(Continued on p 40)

now...

for the first time, a Cyclone brochure filled with facts, tables, recovery curves . . .



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Slurry Classification...
Water Clarification...
Recovery of Suspended Solids...

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Current Coal Patents

By: Oliver S. North

Pneumatic material separation, R. E. Dawson (assigned to Thompson-Starrett Co., Inc., Chicago, Ill.), May 13, 1958. In an airflow coal separator, need for a dust separator is obviated by maintaining in the bed of material a two-way reciprocating air flow. No. 2,834,462.

Boring type mining machine having four boring heads, C. C. Boesewetter (assigned to Goodman Mfg. Co., Chicago, Ill.), May 13, 1958. Multiple-head boring machine having two conveyor throats disposed adjacent to the outermost boring heads. No. 2,834,588.

Method of blocking the ways of damps in mines, W. Bauer, May 20, 1958. Method for effectively blocking out fire damp in coal mines. A phosphoric or oxalic acid-catalyst solution and a preliminary condensate of a urea formaldehyde resin are simultaneously sprayed around openings or wherever a block is desired. The mixture produces a foam which quickly hardens into a volume-stable, fire damp-resistant material that clings to its surroundings. The basic raw materials occupy very little space in the mine. No. 2,835,330.

Process for recovery and purifying of finely divided heavy materials, K. F. Tromp, May 20, 1958. Process for recovery and purification of magnetite or other high specific gravity solids from coal washing plants. Magnetic recuperation is combined with gravimetric recuperation in such a manner that the magnetisable heavy material is first separated magnetically. Separation of non-magnetisable particles is then effected in a stream washer. No. 2,835,384.

Plant for conveying granular or solid products, notably coal sludges, through hydraulic means, M. M. Christille (assigned to Houilleres du Bassin de Lorraine, Merlebach, Moselle, France), May 20, 1958. Improved coal sludge conveying means whereby clogging is prevented and wear of lower generatrices of the pipeline is minimized. Optimum solids concentration is determined, and then a suspension of that value constantly maintained from point of mixing to place of use, or de-watering, of the slurry. A concentration of about 300 grams of coal per liter of water is generally preferred. No. 2,835,536.

Continuous mining machine of the boring type having adjustable cutter chains, B. F. Tracy and J. O. Eads (assigned to National Mine Service Co., a corporation of W. Va.), May 27, 1958. Design for upper and lower cusp cutter chains to be used on a continuous coal mining machine, whereby maximum safety for operators and other mine personnel is obtained. No. 2,836,407.

Rotary cutting, core breaking and conveying means, A. L. Barrett (assigned to Joy Mfg. Co., Pittsburgh, Pa.), May 27, 1958. Rotary disintegrator having improved means for dislodging coal from a solid vein and conveying broken mineral from the working face. No. 2,836,408.

Gathering arm for underground load-

NEW ECONOMY... with DRAVO-SCHENCK vibrating screens— feeders—conveyors

Through an exclusive agreement, Dravo Corporation is now licensed to manufacture vibro-conveyor equipment based on the original designs developed and patented by the Carl Schenck Company of Darmstadt, Germany.

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Our engineers will confer with you on specific problems. Complete information on this equipment is available. Write for Bulletin No. 1475, Dravo Corporation, Pittsburgh 22, Penna.

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the new **CARDOX**

HEAT-TREATED ALLOY-STEEL AUGER

outlasts all others 2 to 1 or better . . .

Here is an auger built to perform under the most difficult drilling conditions.

The new Cardox roof auger is really made to take it. Shaft and flight are of toughest alloy steel, perfectly welded, then heat treated for maximum strength and maximum resistance to abrasion. One extra pitch of flight is added at the shank end for additional strength at point of greatest stress.

When we say it outlasts all others, we mean it. Tests under the most severe conditions have proved this new Cardox auger makes an immediate and substantial reduction in auger costs wherever it is used.

The new Cardox roof auger is made in any length from 10″ up, with all standard shanks. Write today for a demonstration by one of our field engineers.

CARDOX *can meet all your drilling requirements.*

AUGERS— 1¼″ to 48″ in diameter

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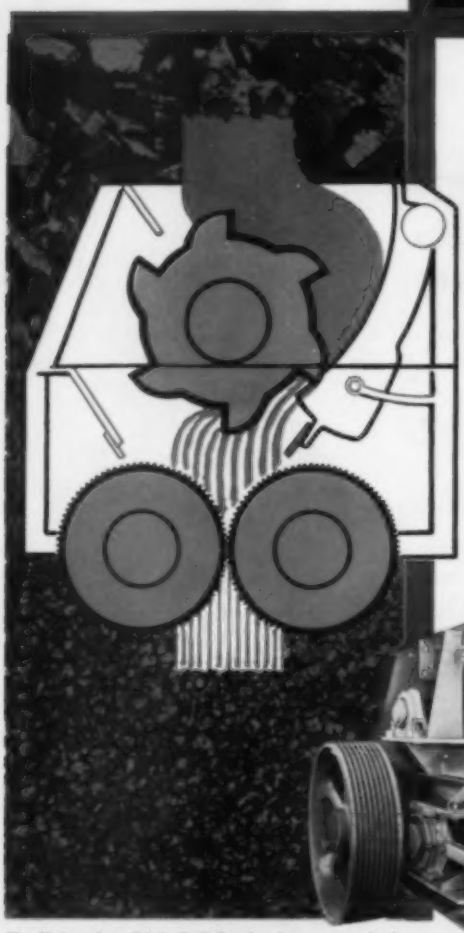
CRUSH RUN-OF-MINE TO FINE SIZES

IN THIS TWO STAGE UNIT



With a ratio of reduction greater than ever before available, this single two-stage unit does the work normally assigned to two crushers. A unique hydraulic system allows changing product size without stopping the crusher, and also protects against tramp iron.

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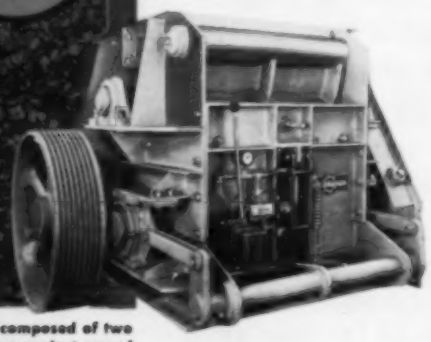

The McLanahan Triple Roll Crusher is composed of two elements—a primary single roll crushing against curved crushing plate; and double roll secondary performing the final reduction.

McLANAHAN
SINCE 1835
BLACK DIAMOND
TRIPLE ROLL CRUSHER
McLANAHAN AND STONE CORPORATION • Hollidaysburg, Pa.

Patents *(Continued)*

ers, H. M. Albers (assigned to Poor & Co., Chicago, Ill.), June 3, 1958. Improved gathering arm for sweeping loose coal onto a conveyor from a pick-up apron or gathering head. One type of arm is suitable for both right- and left-hand side of the machine, thereby lessening variety of parts to be stocked and handled. No. 2,837,197.

Tensioning device for extensible conveyors or the like, R. F. Lo Presti (assigned to Goodman Mfg. Co., Chicago, Ill.), June 3, 1958. Gravity take-up device for extensible conveyor maintains proper tension on both the conveyor belt and the support strands. No. 2,837,204.

Apparatus for drilling large holes between galleries, M. Aschacker (assigned to West Canadian Collieries Ltd., Blairmore, Alberta, Canada), June 3, 1958. Device for drilling large diameter holes between galleries in coal beds or the like, using relatively lightweight equipment. A pilot hole is drilled to act as a guide for the cutting head. No. 2,837,324.

Rotary type tunneling machine, A. R. Biedess (assigned to Goodman Mfg. Co., Chicago, Ill.), June 3, 1958. Design for a machine capable of boring a tunnel of large diameter without the need of blasting. Mechanism can be steered in both horizontal and vertical directions as desired, thereby making a tunnel of changing gradient and alignment. No. 2,837,325.

Process for gasifying carbonaceous fuels, C. R. Carkeek and D. M. Strasser (assigned to The Texas Co., New York, N. Y.), June 10, 1958. Improved process for synthesis of hydrocarbons from anthracite, bituminous coal, lignite or oil shale. No. 2,838,388.

Electrolyte for storage batteries and process for producing the same, C. A. Sarder, June 10, 1958. Use of lignite coal in the manufacture of a storage battery electrolyte. No. 2,838,429.

New Books

Illinois Coal Study

Petrographic and Coking Characteristics of Coal, by C. E. Marshall, J. A. Harrison, J. A. Simon and M. A. Parker describes the results of laboratory studies of the Illinois Nos. 5 and 6 seams. These studies were undertaken primarily to examine the influence of petrographic factors on the character of cokes produced from Illinois coals. Procedures and test results for both seams are

North...south...east...or west...

pit owners cut costs with rugged pivot-steer haulers

From Georgia to Wisconsin... from Virginia to California... pit owners are operating under widely varying job and weather conditions. But there's one thing all pits shown have in common... the type hauler they bank on to cut pit costs. It is the rugged LeTourneau-Westinghouse Tournapull® Rear-Dump.

Wherever they operate, these machines dump clean and fast... clear over banks, or into hopper. Front-wheel drive holds Rear-Dump steady and safe at soft bank-edge. Units have big, wide, all-steel bodies for fast loading and low maintenance. And, go-anywhere 'Pulls* haul through mud or slippery going where conventional haulers would have to call it "quits."

Read these owner-verified reports... then give us a call. We'll be happy to show you how these electric-control Tournapull Rear-Dumps can fit into *your* operations to help *you* cut pit costs. Three sizes: 11, 22, and 35 tons; with 138, 210, 300 or 335 hp diesel engines.

N

Wisconsin gravel pit — In an effort to step-up production and cut hauler maintenance expense, this large gravel pit replaced a fleet of trucks with 3 Tournapull Rear-Dumps — 2 "D's" and a "C". Says pit superintendent, "Most truck bodies are too thin. Our work is also too hard on truck tires, transmissions, differentials, springs, and drive shafts. These rugged L-W units outlast ordinary haul trucks 10 to 1."

Virginia limestone pit — 3 D Rear-Dumps replace 10 trucks... together, haul 1000 tons of rock to crusher per 8½-hr day. Comments owner, "We went through $56,000 worth of trucks in 5 years before we switched to Tournapull Rear-Dumps. These machines are the only thing for hauling rock. Trucks just can't compare." Says operator, "They're as simple to run as a car. I like 'em fine!"

W E

California quarry — Tough underground tunneling operations required a rugged hauler that could maneuver in extremely cramped quarters, haul over narrow, winding roads. Pit owner's choice — 3 C Tournapulls with 22-ton Rear-Dumps. Unit is shown making continuous 180° turn (with body in dump position) in area just 20'8" wide. Electric controls also contributed to ease of operation and safety.

Georgia kaolin pit — Despite wet, slippery roads, 2 D Tournapulls with 11-ton Rear-Dumps haul sand and red clay overburden 500' to dump in 1 min 24 sec. With electric-hoist, bowl can be lifted for full, instant dump, or held at any angle for slow, precision feeding into hopper. Mine superintendent likes 'em, "cause they're easy to maneuver... pull themselves easily out of soft footing."

S

*Trademark R-1836-MQJ-1

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A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

READY!
AIM!
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WITH
BEE-ZEE
SCREENS
Often a miner's only weapon against production delay or product inferiority is a Bee-Zee Screen. At mine after mine these welded, stainless steel screens improve and speed separation... resist clogging and abrasion...increase dewatering or deliquefying. At mine after mine Bee-Zee Screens are the difference between problems and profit.
Get your most marketable product now...faster ...at less cost. Ask your screening equipment manufacturer how Bee-Zee Screens can make you money.
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New Books (*Continued*)

described in detail. Contains 100 illustrations and 36 tables. *Bulletin 84. 120 pp. 6¾ x 10-in; paper. Illinois State Geological Survey, Urbana, Ill.*

USBM Bibliography

Bibliography of Bureau of Mines Investigations of Coal and Its Products, by E. P. Carman and F. S. Bayes lists 1,000 technical and economic reports, articles and other publications describing USBM research and development work between 1950 and 1955. Topics include mining, preparation, carbonization, transportation, storage, and utilization as fuel and as sources of synthetic liquid fuels and coal chemicals. *Information Circular 7825. U. S. Bureau of Mines, Publications-Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.*

Standards

Supplementary List of Publications of the National Bureau of Standards, July 1, 1947 to June 30, 1957 is a supplement to the National Bureau of Standards Circular 460. Publications listed include applied mathematics series, building materials and structures reports, circulars, handbooks and research papers. *373 pp. $1.50. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.*

People in Coal (*Continued*)

Richard T. Todhunter Jr. has been elected president of Barnes & Tucker Coal Co., Barnesboro, Pa. The election took place at a recent meeting of the company directors. Mr. Todhunter has held the positions of general superintendent, general manager and vice president in his career with Barnes & Tucker. He succeeds Richard T. Todhunter Sr., who resigned as president last January after a 12-yr tenure in that office and after a career in coal that spans 70 yr.

Howard Herzog, New Athens, Ill., has been named superintendent of overburden preparation for Peabody Coal Co., succeeding **Fred Horne,** Evansville, Ind., retired. Mr. Herzog will be in charge of drilling and blasting operations at 21 Peabody strip mines in the Midwest. He was formerly blasting foreman at River King mine, Freeburg, Ill.

Obituary

Lewis Stein, 56, president, Elliott Coal Mining Co., Philipsburg, Pa., died last month at the Philipsburg State Hospital after a brief illness. Mr. Stein developed the Elliott enterprise into one of the largest stripping operations in central Pennsylvania.

Speedy Tournatractor completes various widely-separated tractor jobs fast and efficiently. Tractor drives anywhere under its own power — its big, rubber tires cross pavement, RR tracks, without damage. Big, multi-disc air brakes (3,762 sq. in. of braking surface) give operator confidence when traveling down steep grades or at high speed.

A "sure-fire" way to CUT PIT COSTS

When modernizing your pit operations, don't overlook the savings you can make by replacing 2 or more slow-moving track-type tractors with a fast, rubber-tired tractor, to handle your scattered pit and road clean-up. This *one* speedy tractor can complete the same (or more) assignments — without need for extra machines and operators.

These "sure-fire" savings are possible with a fast, rubber-tired LeTourneau-Westinghouse Tournatractor®.

1. One L-W tractor can often replace 2 to 3 crawlers, cutting your cost for operating and maintenance, fuel, and spare parts.

2. Between pit chores, your fast, rubber-tired tractor can handle haul-road maintenance and drainage problems. Good haul roads help to lower your hauler repair costs . . . keep these production units rolling fast and safely, to complete more cycles per hour.

3. Mobile, 210-hp Tournatractor easily drives to new areas of operation under its own power, at speeds to 17.2 mph. It goes right to work to clear land, strip overburden, build access roads. Rubber-tired tractor needs no flatbed trailer, truck, and extra manpower to load and transport unit to remote operations.

4. Cleans-up around plant area, dresses and seals stockpiles, eliminates excessive waste.

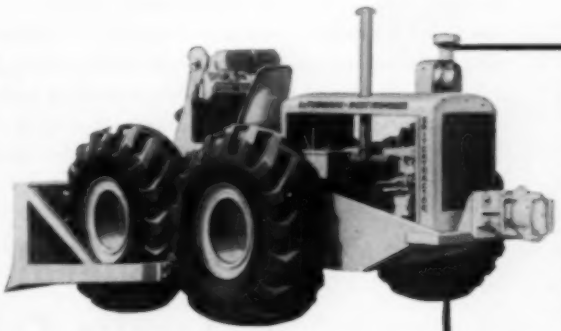
5. Tournatractor spots rail-cars, tows equipment — reduces costly time waiting for switch engines.

6. In winter, with V-type snow plow, L-W tractor plows snow from roads, loading and dumping areas — keeps pit operations open and safe in all kinds of weather.

Every tractor assignment — anywhere on your property — can be handled quickly and efficiently by versatile Tournatractor. And, if your pit normally sidelines equipment during its off-season, this mobile L-W tractor can be rented out to nearby pits, contractors, counties, or municipalities. It's easy to keep Tournatractor busy all year long!

Try it in your pit

Let us demonstrate a LeTourneau-Westinghouse Tournatractor in your pit. Write or phone for complete information. No obligation.



Standard Type E railway car coupler is one of 10 Tournatractor attachments available to help you cut tractor costs. With coupler, this powerful off-track switcher spots and groups rail-cars fast. Big, rubber-tired wheels on SwitchTractor† straddle rails, ride on ballast and tie-ends — deliver double the tractive effort of steel-wheeled switchers on steel rails.

†Trademark CT-1811-MQ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

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The Wise Bird says . . .

"CLARKSON REDBIRD"

for the very finest in Conveyor Chain

Here's why...

Clarkson Redbird **has the *welded* flight assembly that ends once and for all any need for adjustment, lessens wear and strain, eliminates stripped and corroded threads, loosened and lost nuts. *Clarkson Redbird* Conveyor Chain is shipped in assembled sections—no need to bolt flights to chain piece-by-piece . . . just join two or three sections to make a complete chain, ready for your hardest service. Ask us for the many supporting reasons for *Clarkson Redbird* leadership in conveyor chain performance—today!**

National Mine Service Company

Pittsburgh 19, Pennsylvania

All-State Division Logan, W. Va. | Anthracite Division Forty Fort, Pa. | Ashland Division Ashland, Ky. | Bonnaco Division Beckley, W. Va. | Clarkson Division Nashville, Ill. | Kentucky-Virginia Division Jenkins, Ky. | Western Kentucky Division Madisonville, Ky. | Whitaman Division Indiana, Pa. | Mountaineer Division Morgantown, W. Va.

In a hurry for track spikes?

If you need track spikes in a hurry, call Bethlehem. We make spikes by the millions, and for every weight of rail from 12 lb to 155 lb. Most sizes are carried in stock, ready to go at a moment's notice.

Bethlehem Spikes are made to AREA and ASTM Specifications. They have sharp points for fast, accurate driving, and strong heads which can take heavy pounding. We also make spikes of special design. Tell us about your requirements.

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Coal Abroad

Integration, Plus

Russian iron-and-steel center to be based on hydroelectric power.

Russia hopes to build 70 hydroelectric power stations on the Amur River and its tributaries, an area rich in iron and coal deposits, Soviet sources report. The stations are to have a total capacity of from 15 to 20 million kw, and will transform the area into a major iron and steel producer. Designs have been completed on the primary task of harnessing the Amur basin, an area of about 700,000 sq mi.

A system of dams at the hydro sites also will provide flood control and, in some instances, provide regular navigation along certain of the rivers.

OVERSEAS FLASHES

BRITAIN—Coal rationing will end in Britain in mid-July after nearly 19 yr. Started in September, 1939, it is the last major war-time rationing program still in effect. The government estimates production of large coal, mainly for domestic and railway consumption, will exceed requirements by about 1 million tons this year, reaching 47.5 million tons. There is also a surplus of small coal. Price controls will end with rationing.

JAPAN—The Japanese ministry of international trade and industry recently allocated $19 million out of a $35 million budget to buy about 1.2 million tons of coking coal during the first half of the fiscal year. A spokesman for the ministry said that approximately 1 million tons will be bought from the United States and Australia and 200,000 tons from Russia. The tonnage to be obtained from Russia was agreed upon in the recent Japan-USSR trade talks.

ARGENTINA—The Argentine government has announced the creation of an autonomous organization for the control of state coal deposits. The new agency is to be known as Yacimientos Carboniferos Fiscales (YCF) and will be shaped along lines similar to the Argentine state oil monopoly.

First target of YCF will be the development of Argentina's principal coal mines at Rio Turbio, Santa Cruz province Production at Rio Turbio reached a peak of 203,000 tons last year. Increased mechanization is the order of the day in hopes of reaching an annual production goal of 1.2 million tons. Financing reportedly was provided by French interests.

WEST GERMANY—Vice Chancellor Ludwig Erhard, during his recent visit to the U. S., said that growing coal stocks in West Germany should make it understandable if German importers should seek to stretch their U. S. coal contracts over a longer period of time. He added that the same importers might exercise a certain reserve in making new contracts. He said however that reports from Bonn that he would tell the U. S. government while here that Germany plans to cut back importation of American coal were not correct. The contracts had been completed as private commercial agreements, and the government of West Germany has no right to interfere with them.

BRITAIN—Reports in recent issues of Coal Age, in this department, concerning the Neyveli lignite development in India, should have included the information that Powell Duffryn Technical Services, Ltd., London, has eight engineering advisers on the scene serving Neyveli Lignite Corp. The Powell-Duffryn firm has been associated with the Neyveli lignite projects since 1954.

haulage capacity...

Place: Wheelwright, Kentucky
Wheelwright Mine and
Price No. 1 Mine
Operator: Inland Steel Company
Mine Car Dimensions: 24'6" (body length)
Height: 24" above rail
Width: 8'0"
Weight: 8600 lbs. (empty)
Capacity: 262 cubic feet (level load)
392 cubic feet (crown load)

where can you match it?

Since 1915—
Pioneers in
haulage equipment

DIFFERENTIAL
STEEL CAR COMPANY
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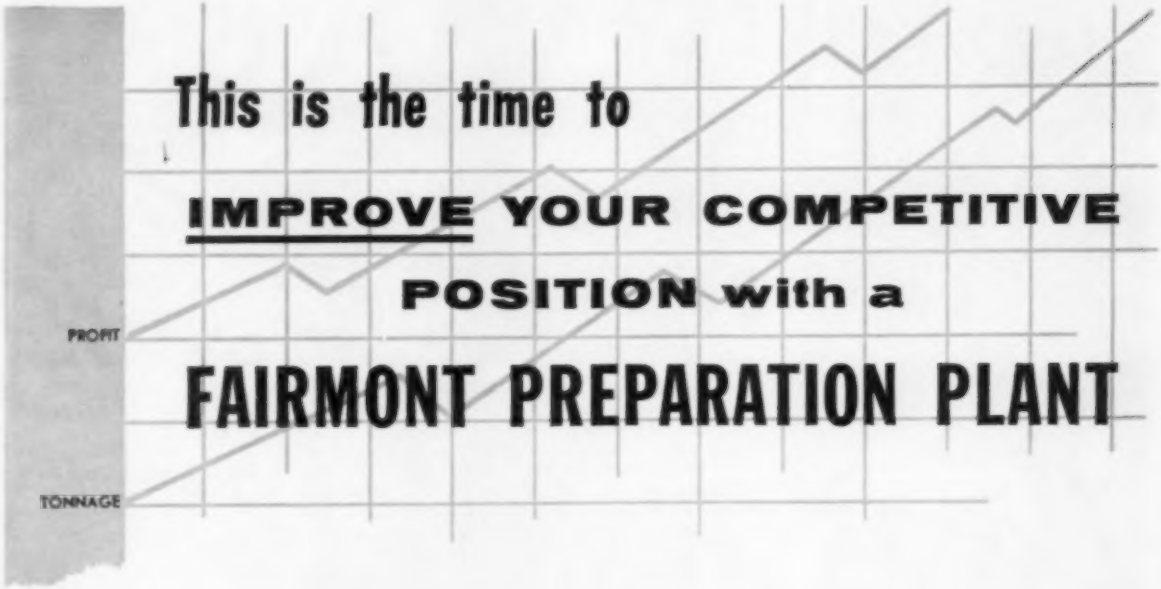

This is the time to IMPROVE YOUR COMPETITIVE POSITION with a FAIRMONT PREPARATION PLANT

The evidence is everywhere, throughout all business, competition is becoming more keen—more aggressive. This is no less true in the coal industry where it is quite evident that to the alert, progress-minded operator will go the sales which spell TONNAGE and PROFIT.

To mechanize is wise but this alone is not enough. The trend is clear—users want a clean, upgraded product—a product in demand—a product which commands a better price—a product possible when you clean and grade your coal in a FAIRMONT-designed and constructed preparation plant.

Here then is how to match and outstrip competition and make money doing it—put your coal through a Fairmont cleaning plant—the plant that guarantees product uniformity and over 99% separating efficiency through an extra wide product size range of 1/8" to 10" in any tonnage capacity.

Why be satisfied with less than the best when you can have the best simply by lifting your phone and calling Fairmont, W. Va. 1672.

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DESIGNERS AND CONSTRUCTORS OF COMPLETE PREPARATION PLANTS USING BOTH WET AND DRY CLEANING, CENTRIFUGAL AND THERMAL DRYING.

Before we built this bin we had to know...

1. The characteristics of the material.
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Over a long period of years, we here at Neff and Fry have learned that a strong bin is only part of the storage problem.

While we do not sell machinery, nor are we affiliated with any machinery manufacturers, we can be of great help to you in suggesting loading and unloading systems.

On your next storage bin, call us in on the early stages of planning. You will have a better bin.

NEFF & FRY • 320 Elm Street, Camden, Ohio

N & F

The difference is in the shape of the STAVE!

ILLINOIS COAL ADVISORY COMMITTEE and guests at Urbana—Howard Harder (left), Sahara Coal Co.; John Patton, Truax-Traer Coal Co.; Jack Ellis, Peabody Coal Co.; L. P. McLaughlin, Wisconsin Steel Co.; George Land, consulting engineer; Gene Utterback, United Electric Coal Cos.; Kemmeth Nebbs, Moffat Coal Co.; W. A. Weimer, Peabody Coal Co.; Henry Kelley, Republic Steel Corp.; A. G. Gossard, Snow Hill Coal Corp.; R. C. Rasmussen, Bell & Zoller Coal Co.; B. R. Gebhart, Freeman Coal Mining Corp.; O. S. Braden, Youngstown Sheet & Tube Co.; Thomas Garwood, Freeman Coal Mining Corp.; Raymond Exum, Old Ben Coal Corp.; George Keller, U. S. Steel Corp.; E. D. Martin, Inland Steel Co.; A. H. Brisse, U. S. Steel Corp.; R. B. Starek, Old Ben Coal Corp., and Carl Hayden, Sahara Coal Co.

Coal Men Meet at Urbana

REPRESENTATIVES of Chicago- and Pittsburgh-area steel companies and Illinois coal producers had a preview of the latest developments in coal and coke research conducted by the Illinois State Geological Survey. The occasion was the Spring meeting of the Coal Advisory Committee of ISGS, held at the survey's laboratory on the campus of the University of Illinois at Urbana, May 21-22.

Survey research men, working with an experimental pilot-plant coke oven, demonstrated to the committee that contrary to long-standing belief, Illinois coal can produce coke suitable for the metallurgical industries. Increased production of coke from Illinois coal would have a tremendous impact on the economy of the state, Dr. John C. Frye, chief, ISGS, pointed out. Not only would the Illinois coal industry benefit from expanded markets, but the nearby steel industries would save much of the money now spent on freight charges when coal is brought to Illinois from the East.

Since the coke research program began in 1943, Illinois coal has been used successfully for coking in some steel plants in the Chicago and St. Louis areas.

The Coal Advisory Committee, made up primarily of representatives of the Illinois coal industry, works closely with scientists of ISGS. Meetings of the committee are held twice a year at the Survey facilities at Urbana. The special demonstrations and laboratory tours highlighting the most recent meeting were arranged to acquaint the steel industry with the research program. Following the demonstration, a discussion session was held, at which chemical quality, heating properties, and physical constituents of Illinois coal were related to its utilization by industry.

Chairman of the Coal Advisory Committee is B. R. Gebhart, vice president, Freeman Coal Mining Corp., Chicago. Dr. Clayton G. Ball, president, Paul Weir Co., Chicago, is vice chairman, and Dr. Frye is secretary.

News Roundup *(Continued)*

$2.78; Dist. 12—$1.40; Dist. 13—$2.515; Dists. 16, 17 and 18—$2.796; Dists. 19 and 20—$2.82; Dist. 21—$2.226; Dist. 22—$2.846; Dist. 23—$2.735.

Coal-Based Plant In Northwest

Proceed with engineering design of steam-electric station in Washington.

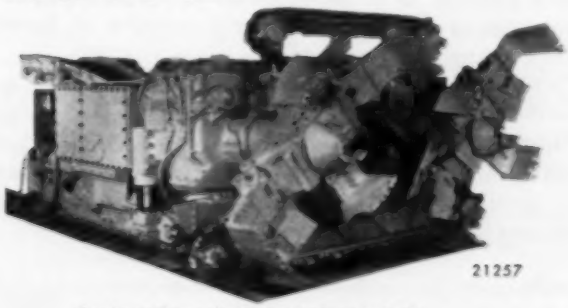
With a supply of coal apparently assured, the Washington State Dept. of Conservation is ready to proceed with plans for 250,000-kw steam-electric station in the Roslyn-Cle Elum coal field. Northern Pacific Railway Co., owner of the coal in the area, and Kittitas County Public Utility Dept., sponsor of the power-plant study are reported to be in agreement on terms of an option under which the PUD could purchase the rail-

Photo 21558 Patented

How to make coal mining really pay off

3,749,103 tons of raw coal—6 continuous borers—no major overhauls . . . this was the record payoff at a prominent mine by the end of 1957 with Goodman Borers. The first machine was installed March 1954 . . . the sixth, December 1955. One borer produced 776,170 tons of the total, another 697,687 tons and a third 616,825 tons.

During 1957 alone, the six borers in both development and pillar work mined 1,405,540 tons of coal. This averaged 606 tons per machine shift . . . even with one borer out of service several months after being buried in a slate fall. Two others were working under severe roof conditions that adversely affected average tonnage figures.



Goodman Borer design is clean and simple. Features a minimum of large moving parts.

And here's the second part of the big payoff . . . at year's end not one of the six borers had a major overhaul—since original installation. Further, in several instances the yearly maintenance cost per machine was lower than that of a conventional-equipment-face-unit of cutting machine, drill and loader.

The high tonnage, low down-time combination built into every Goodman borer can make coal mining really pay off. It's a combination that keeps men and machine at the working face, produces more coal with less supervision . . . and makes the capital invested look better with each production report.

You can see a Goodman Borer in action. Let us arrange it.

GOODMAN
MANUFACTURING COMPANY
Halsted Street and 48th Place, Chicago 9, Illinois

CUTTING MACHINES • CONVEYORS • LOADERS
SHUTTLE CARS • LOCOMOTIVES • CONTINUOUS MINERS

Use Genuine Goodman Replacement Parts

Steel changes for the S-12V stopers are 24, 30, and 36 inches long. Overall stoper heights are 37, 43, and 49 inches.

Large openings and high vacuum make the Vac-Nu-Matic dust box equally efficient at removing dry or wet cuttings.

Right: The new S-12V Vac-Nu-Matic fills the need for a heavier dust-collecting stoper to speed up roof-bolting operations which are so essential to continuous coal mining.

New Le Roi Dust-Collecting Stoper Speeds Drilling in Hard Top Formations

S-12V stoper features popular Vac-Nu-Matic® dust collection system.

Enables miners to increase drilling footage with less effort.

The new Le Roi S-12V Vac-Nu-Matic stoper combines greater heft, more power, and positive "through-the-drill-steel" dust collection — for faster, dustless drilling of roof-bolt holes in hard top formations.

Its powerful piston impact, free-cutting bits, and powerful rotation assure faster penetration—eliminate stuck steel. The stoper's heavier construction is balanced for easy handling—enables the operator to work more efficiently and in greater safety.

Le Roi's Vac-Nu-Matic dust-collection system is an integral part of the stoper. Since no additional equipment is needed, the S-12V reduces set-up time and can be moved easily to any part of the mine.

Positive Dust Collection

All system components are specially designed to assure positive dust collection throughout the entire drilling cycle. This integrated design keeps dust count in the drilling area well below the approved Bureau of Mines standards.

What's more, the S-12V can be used with two types of bits to cope with changing seam structures. The Vac-Nu-Matic bit is best suited for soft formations, while the 5-hole CRD bit is recommended for medium to extremely hard top structures.

A touch of the operator's finger-tip provides finely graduated feed-pressure control to meet varying requirements. Constant blowing at the chuck keeps cuttings out of drilling mechanism, assuring long, trouble-free service. Other features include socket-type sliding chuck, end-seating automatic valve, positive pressure in both directions, and short stroke.

Feeds and Weights

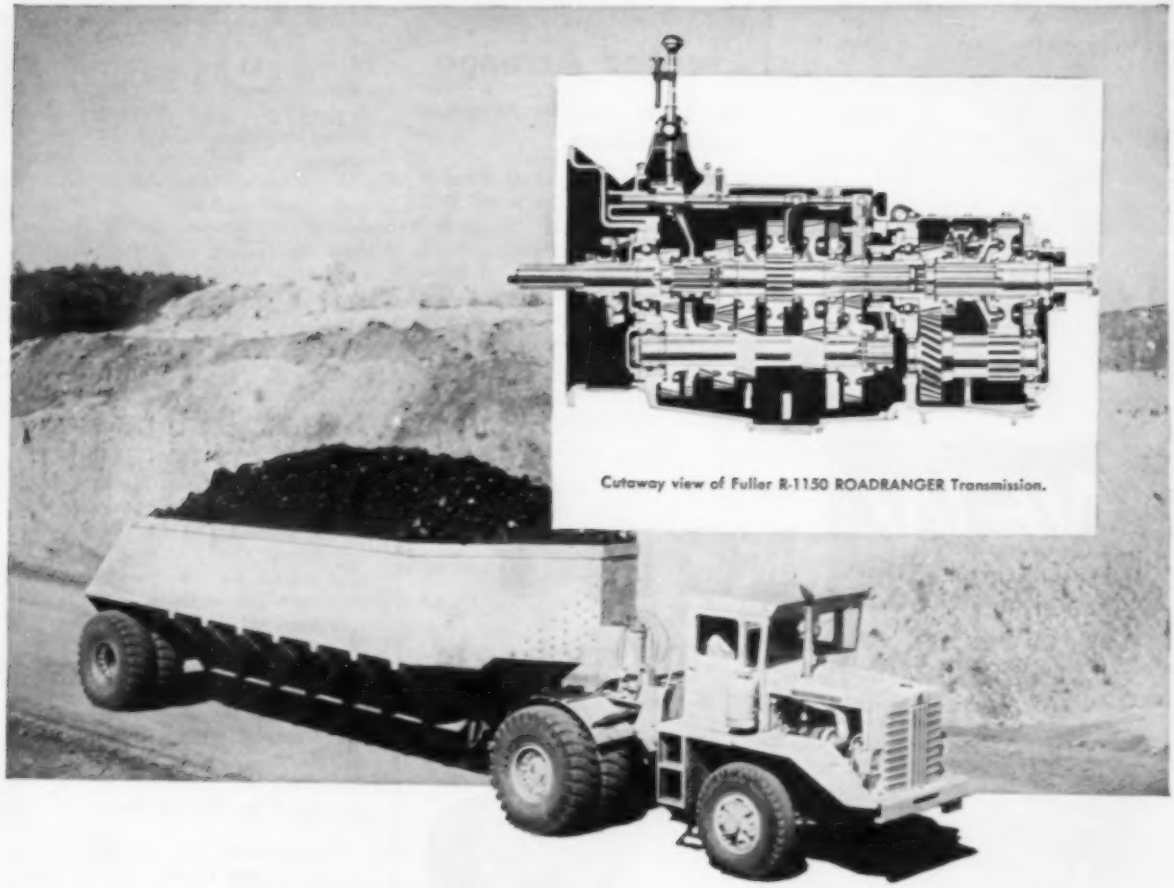
The new S-12V stopers are available with 28-, 34-, and 40-inch feed legs, and weigh 105, 110, and 115 lbs. respectively. All are adaptable for hand-held operation or jumbo mounting.

Write today for information on the new stopers. Also ask about the new dust-collecting conversion kits that Le Roi offers to change older S-11 and S-12 stopers to cost-saving Vac-Nu-Matic dust collection.

"Vac-Nu-Matic" is the registered trademark for Le Roi's dust collecting stopers, bits, and dust boxes.

WABCO

LE ROI Division of Westinghouse Air Brake Co., Milwaukee 1, Wisconsin, manufacturers of Newmatic air tools, portable and Tractair® air compressors, stationary air compressors, and heavy-duty industrial engines. Write us for information on any of these products.



Cutaway view of Fuller R-1150 ROADRANGER Transmission.

Geared by FULLER... New International Coal Hauler hustles 56-ton pay loads

This giant-sized International Bottom Dump Coal Hauler handles heaped pay loads up to 79 cubic yards at speeds to 38 mph. This takes brute power . . . and rugged components to keep the loads moving under fast work cycle schedules.

This is why the new 335-hp International 95 Bottom Dump Coal Hauler is offered with a 9-speed, semi-automatic Fuller R-1150 ROADRANGER® Transmission. Designed and built for this heavy-duty service, the R-1150 ROADRANGER offers these important advantages:

- **No gear splitting—9 selective gear ratios are evenly and progressively spaced.**
- **Easier, quicker shifts—38% steps between ratios.**
- **One shift lever controls all 9 forward and 1 reverse speeds.**
- **Engines operate in peak hp range with greater fuel economy.**
- **Less operator fatigue—1/3 less shifting.**
- **Range shifts pre-selected—automatic and synchronized.**

Faster work cycles, lower fuel consumption, longer engine life, bigger profits—these are the important advantages of specifying rugged ROADRANGERS in your new off-highway equipment.

FULLER

TRANSMISSIONS

FULLER MANUFACTURING CO. Transmission Division • Kalamazoo, Mich. Bolt Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest. Dist. Office, Tulsa 3, Okla.

way's mining plant, preparatory to securing a lease on the coal reserves. Earl Coe, state director of conservation, said details were expected to be completed by June 12, when they will be presented to the Governor's Power Advisory Committee at Olympia.

The option would be made at no cost to PUD for the first 2 yr and will be on a 50-yr basis with renewable privileges, Mr. Coe said. The PUD also is proceeding with details of proposals it will make to prospective purchasers of power from the plant.

House Approves Increased Acreage

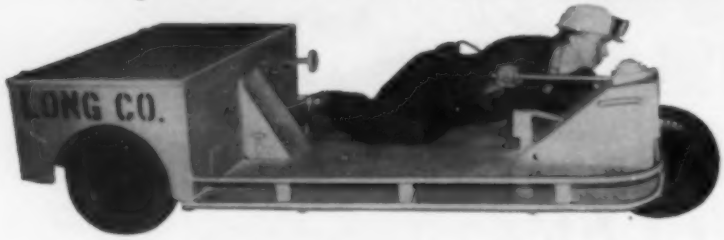
Action paves way for Wyoming industrial expansion.

A bill to double the acreage of public coal lands which could be leased by a single firm, approved by the Interior mines and mining subcommittee, brings closer to realization the greatest industrial development in Wyoming history, Gov. Milward L. Simpson says. It opens the door for a $50-150 million synthetic fuels industry and development of iron ore deposits in southeastern Wyoming.

I. N. Bayless, president, Union Pacific Coal Co., said U-P would build a $3 million coal-carbonization plant at Rock Springs, Wyo., if Congress amends the present coal-lease law. The bill would increase the limits on public-domain coal lands which could be leased by a single company, from the present 5,120 acres to 10,240 acres. The bill also provides for leasing an additional 5,120 acres after a public hearing and approval of the Secretary of the Interior. The Senate approved bill contains provision for additional leasing of 10,240 acres.

NEW LONG

"Inspector's Friend" UTILITY CAR



A battery-operated utility vehicle, the LONG "Inspector's Friend" is designed for personnel and supply handling. With a capacity of operator plus 500 pounds, its primary applications are: travelling between the belt drive unit and the face; transportation for supervisory, engineering, and maintenance personnel; supplying breakdown items to the face during the working cycle; assisting in rock dusting; etc.

Although developed by LONG specifically for coal mines, the "Inspector's Friend" is similar in principle to the personnel vehicles that are so widely used in industrial plants. It's readily maneuverable, easy to handle, will work two shifts between battery charges, and is available in 3 models (24", 36" and 60" minimum tramming height) with either open or permissible type electrical construction.

Write today for details or a demonstration.

The LONG Company
Oak Hill, W. Va.

Mines, Companies

A. T. Massey Coal Co., Inc., Richmond, Va., has announced the merger of Liberty Mining Co., Gay Mining Co., and Merrill Coal Co. into the Massey Coal Mining Co., effective July 1 with principal offices at Omar, W. Va.

Officers of the new company are: President—E. Morgan Massey; Executive Vice President—C. W. Jones; General Manager—James S. Laird; Secretary—William Blair Massey, and Treasurer—H. Wayne Mason. The new company will operate Taplin mine, Taplin, W. Va.; Ben Creek No. 1, Timbar, W. Va., and Ben Creek No. 2, Neds Branch, W. Va.

Union Electric Co. has sold its coal properties near Dowell, Ill., to Truax-Traer Coal Co. and United Electric Coal Cos.

Truax-Traer has purchased New Kathleen mine at DuQuoin, Ill., and United Electric Coal Cos. has acquired adjacent coal reserves. Union Colliery Co., the mine-operating subsidiary of Union Electric Co., will continue in existence to administer extensive undeveloped coal reserves near Shawneetown, Ill.

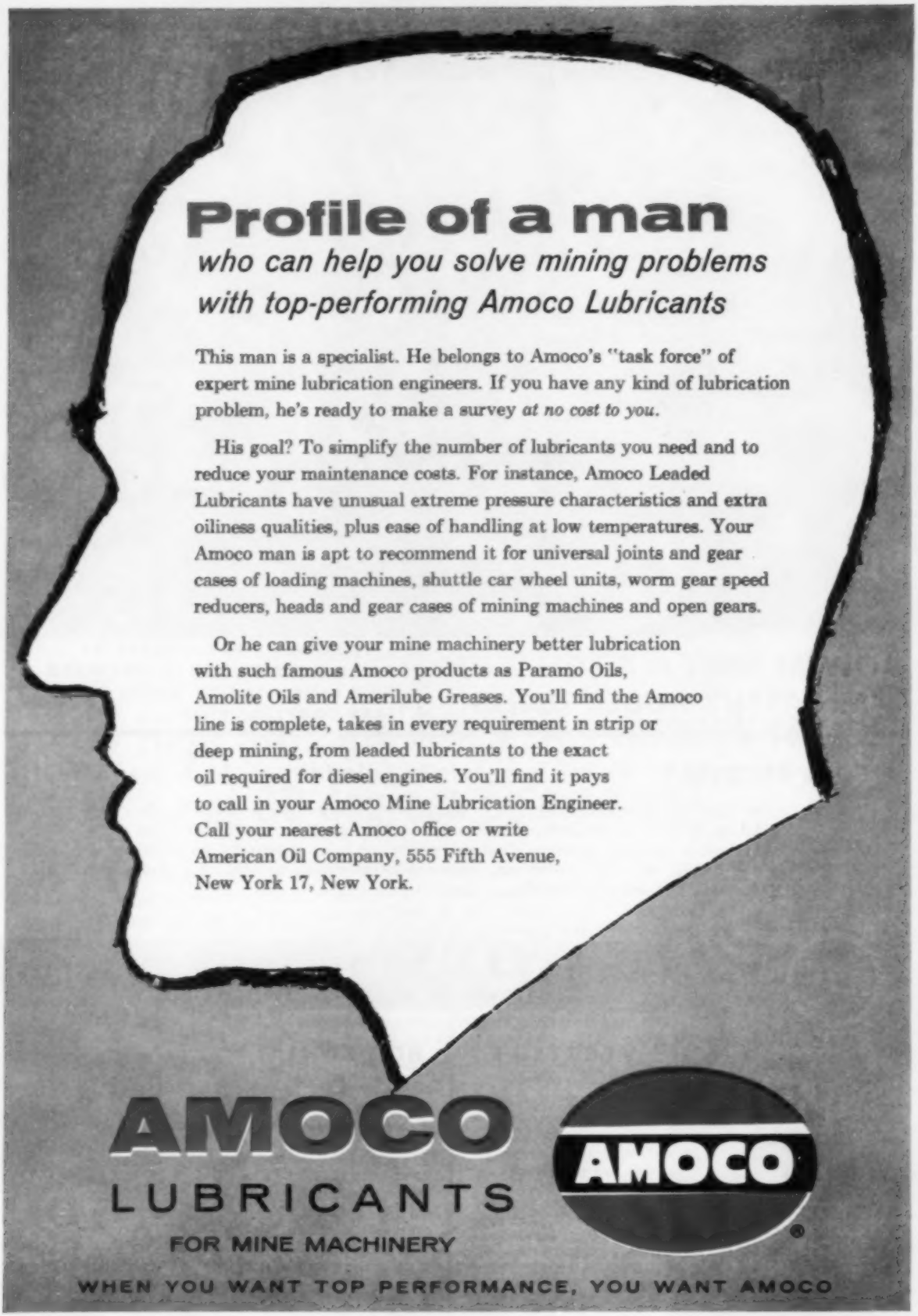
Associations

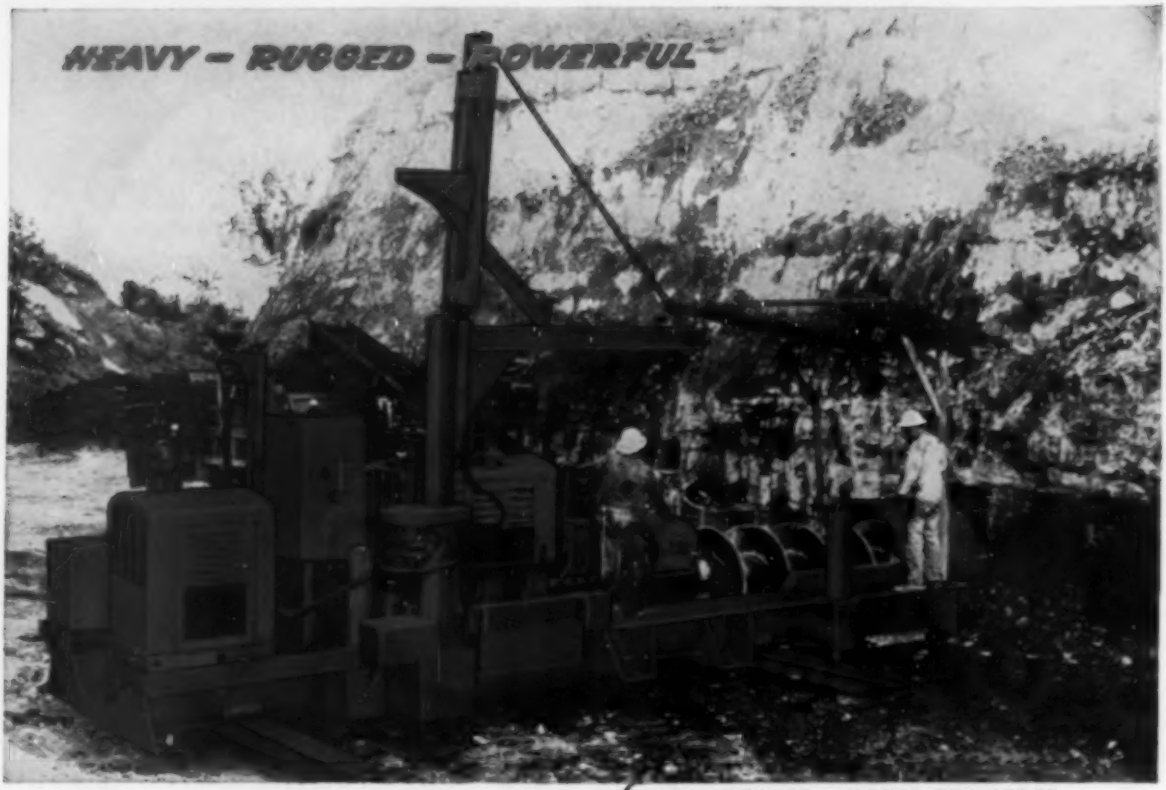
William Crawford, vice president and general manager, Princess Elkhorn Coal Co., David, Ky., has been elected president of Big Sandy Coal Operators Association.

Other new officers are B. F. Reed, secretary-treasurer, Turner Elkhorn Coal Co., Drift, Ky., as first vice president, and George E. Evans Jr. of the Evans Elkhorn Coal Co., Wayland, as second vice president.

National Coal Association will construct an 8-story building to house its own offices and those of other coal-industry associations in Washington.

A site has been selected at 17th and DeSales Sts., N. W., according to the


Profile of a man
who can help you solve mining problems
with top-performing Amoco Lubricants
This man is a specialist. He belongs to Amoco's "task force" of expert mine lubrication engineers. If you have any kind of lubrication problem, he's ready to make a survey at no cost to you.
His goal? To simplify the number of lubricants you need and to reduce your maintenance costs. For instance, Amoco Leaded Lubricants have unusual extreme pressure characteristics and extra oiliness qualities, plus ease of handling at low temperatures. Your Amoco man is apt to recommend it for universal joints and gear cases of loading machines, shuttle car wheel units, worm gear speed reducers, heads and gear cases of mining machines and open gears.
Or he can give your mine machinery better lubrication with such famous Amoco products as Paramo Oils, Amolite Oils and Amerilube Greases. You'll find the Amoco line is complete, takes in every requirement in strip or deep mining, from leaded lubricants to the exact oil required for diesel engines. You'll find it pays to call in your Amoco Mine Lubrication Engineer. Call your nearest Amoco office or write American Oil Company, 555 Fifth Avenue, New York 17, New York.
AMOCO
LUBRICANTS
FOR MINE MACHINERY
AMOCO
WHEN YOU WANT TOP PERFORMANCE, YOU WANT AMOCO



LOWEST COST PER TON WITH McCARTHY AUGER DRILLS

LIVE POWER • RAPID TRAVERSE
SKIDS MOVE SIDEWAYS, FORWARD AND BACK • SAFETY AUGER GUIDE
EASY COUPLING PINS

COAL RECOVERY *"Walks" from hole to hole to auger high-quality coal*

An Ohio miner removes 550 tons of coal in each 8-hour working day with this Model 14 36-42x12' McCarthy drill, operated by two men. He drills 42" dia. holes 144' deep. Auxiliary conveyor eliminates spillage at hole. It operates on either side of drill for working blind cut. Twelve different models of McCarthy Coal Recovery Drills mine low-cost "bonus coal".

Manufacturers of Drilling Equipment Since 1901

SALEM

THE SALEM TOOL COMPANY

SOUTH ELLSWORTH AVE. • SALEM, OHIO, U.S.A.

VERTICAL
MODEL 106-24

World's Fastest Heavy-Duty Vertical Auger Drill

Bores faster, deeper, larger dia. holes than any other auger drill. New gear reduction unit slows auger rotation for operation in hard rock formations. Drills 8" and 9" dia. holes readily in shale and sandstone formations, drills larger dia. holes up to 24" dia. in softer formations.

HORIZONTAL
MODEL 104

Lowest Drilling Costs per Foot, Self-Propelled or Truck-Mounted

Bores up to 12" dia. holes to 150' depth faster, cheaper than any other horizontal drill. Requires less working space, saves many man-hours . . . operates easily in tight, hard-to-reach locations.

FINGER-TIP CONTROL
Gives Desired Rotating Speed of Auger

HYDRAULIC FEED
Provides Any Speed up to 6 Feet per Minute Horizontal Feed of Drill

The dozers, trucks and shovels used at this strip mine in Alaska are made from High Strength Steel. They work all winter in sub-zero weather and even in the summer must dig through permanently frozen ground.

USS High Strength Steel rips through rock at 30 degrees below zero!

Edwards, Nesmith, Ryder, Inc. operates a strip mine in Alaska. It's a hundred miles into the bush and it often takes a year to get heavy replacement parts there. But they haven't had a shutdown since they started in 1953. Why? Their shovels, dozers and trucks are made from High Strength Steel.

Says President and Business Manager Wesley Edwards, "Our equipment has to work every month of the year, and we dig ground that's frozen solid a foot below the surface even in summer. During the winter we have an extra problem—the temperature goes down to 30 degrees below zero. When it's that cold and you have to rip through this sandstone and bone seam, you can crack steel blades pretty easily.

"But, we've had no trouble at all with our equipment made of High Strength Steel. It has actually cut through a mountain of ice and rock to open the sixty-foot vein we're working now."

High Strength Steel handled this job because it's stronger and tougher than structural carbon steel which is still being used in some earthmoving equipment. High Strength Steel has a yield point 50% higher than that of structural carbon steel and it has more resistance to wear, impact, abrasion and atmospheric corrosion.

United States Steel produces three brands of High Strength Steel—COR-TEN Steel, MAN-TEN Steel and TRI-TEN Steel. Each has a specific combination of characteristics that is best for certain jobs.

For more information, write: United States Steel, 525 William Penn Place, Pittsburgh 30, Pa., or contact our District Sales Office.

. . .

USS, COR-TEN, MAN-TEN, and TRI-TEN are registered trademarks of United States Steel

United States Steel Corporation – Pittsburgh
American Steel & Wire – Cleveland
Columbia-Geneva Steel – San Francisco
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Supply – Steel Service Centers
United States Steel Export Company

USS United States Steel

CONTRACT CORE DRILLING

EXPLORATION FOR MINERAL DEPOSITS
INCLUDING URANIUM & LIMESTONE — ANYWHERE

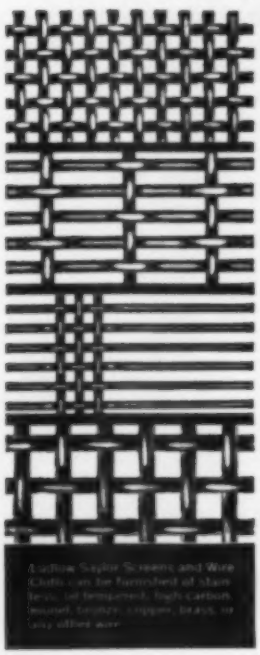
FOUNDATION TEST BORING • GROUT HOLE DRILLING

Skilled crews and complete stock of core drills and accessory equipment maintained at all times

Core Drill Contractors for more than 60 years

JOY MANUFACTURING CO.
Contract Core Drill Division
MICHIGAN CITY, INDIANA

Precision-applied hook strips on LUDLOW-SAYLOR SCREENS insure better fit, uniform tension, longer screen life



Before hook strips are applied, Ludlow-Saylor Screens are trued up on leveling machines and shears to make sure they are perfectly flat and square. Then, bending the hook strips over screen edges is done with special dies made by Ludlow-Saylor to insure absolute accuracy.

The result of this extra care are screens that will fit better and install easier—that can be pulled tighter and will retain a more uniform tension over the entire surface—that won't distort or break—that will last far longer than ordinary screens. *Always order L-S Screens . . . you pay no more for the best!*

Immediate Shipment of most weaves and sizes
Write for Condensed Screen Reference Catalog

Ludlow-Saylor
WIRE CLOTH COMPANY
609 S. Newstead Ave. • St. Louis 10, Mo.

SALES OFFICES: Birmingham, 1727-6th Ave. N.; Chicago, 5708 W. Diversey; Pittsburgh, Union Trust Bldg.; Houston, 5836 Harvey Wilson Drive; Denver, 1530 Carr St. WEST COAST SUBSIDIARY: Los Angeles, Star Wire Screen & Iron Works, Inc., 2515 San Fernando Road.

Associations *(Continued)*

announcement by NCA. The board of directors approved the move at the recent NCA convention at Chicago. The association has occupied quarters in the Southern Building for the past 35 yrs.

Preparation Facilities

Pocahontas Fuel Co., Inc., Central Shop, Pocahontas, Va.—Contract closed with Deister Concentrator Co. for six Concenco Model 77 Diagonal-Deck coal-washing tables.

Slab Fork Coal Co., Gaston mine, Alpoca, W. Va.—Contract closed with Deister Concentrator Co. for four Concenco Model 77 Diagonal-Deck coal-washing tables, one Concenco Model 108-B revolving feed distributor and four Concenco splitters.

Cambria - Clearfield Mining Co., Springfield No. 6 mine, Westover, Pa.—Contract closed with Industrial Engineering & Construction Co. for a cleaning-plant addition, including a Fuel Process Co. M-6 heavy-media washer with magnetic separator, pumps and other auxiliaries to handle 150 tph of 5x⅜-in.

Cambridge Smokeless Coal Corp., Bluefield, W. Va.—Mechanical Equipment & Construction Co., Beckley, W. Va., is prime contractor in construction of a complete 340-tph plant, including washing equipment and silo storage facilities.

Red Parrot Coal Co., Prenter, W. Va.

Anthracite Output

YEAR TO DATE	PRODUCTION
June 14, 1958	9,553,000
June 15, 1957	12,118,000

1958 output 21.2% behind 1957.
A month earlier output was 24.8% behind 1957.

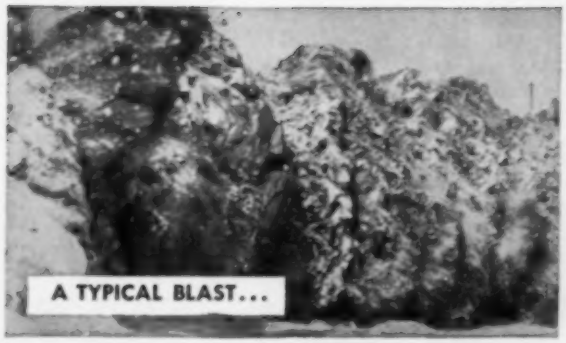
WEEK ENDING	PRODUCTION
June 14, 1958	475,000
June 15, 1957	612,000

Bituminous Output

WEEK ENDING	PRODUCTION
June 14, 1958	176,959,000
June 15, 1957	232,135,000

1958 output 23.8% behind 1957.
A month earlier output was 19.1% behind 1957.

YEAR TO DATE	PRODUCTION
June 14, 1958	8,370,000
June 15, 1957	10,120,000



Compare the Costs of a Blast Like This:

SPENCER A/N MIXTURE — 6¢ lb.

LIQUID OXYGEN EXPLOSIVES — 9¢ lb.

COMMERCIAL A/N BLASTING AGENTS — 13.5¢ lb.

COMMERCIAL DYNAMITES — 18¢ lb.

BIGGER BLASTS AT LOWER COST — that's the story reported by strip miners and quarry owners who have tried the new blasting method with Spencer Prilled Ammonium Nitrate. Savings up to 50% are common.

BETTER FRAGMENTATION — BIGGER PROFITS! Actual field tests show that the new blasting method developed with Spencer Prilled Ammonium Nitrate commonly produces about 25% better fragmentation.

Technical investigation reports: New blasting process has . . .

"Better Explosive Characteristics and Meets Best Overall Requirements..."

Take advantage of Spencer Chemical Company's offer of free technical advice and service. Pioneer in new process, Spencer has extra know-how about nitrate types, packing, detonation.

A new, low-cost blasting method, developed by Maumee Collieries, using Spencer Prilled Ammonium Nitrate, was first announced to the public about two years ago. At this time Spencer reported that this new method cut blasting costs about 50% and moved about 25% more material. Since this time Spencer has pioneered this new, low-cost blasting method all over the world.

More intensive tests reinforce these impressive figures. For example, a West Virginia coal stripper states: "The results of our collaborative investigation leave little doubt that ammonium nitrate has the better explosive characteristics and meets the best overall requirements as an explosive in the field-compounded process. Our continuous research program shows that Spencer Prilled Ammonium Nitrate is a superior product," the West Virginia coal company goes on to say. "It is manufactured under quality control conditions which guarantee a uniform free-flowing product for superior blast effects."

Spencer offers you free technical advice and service, giving you the full benefits of the knowledge and experience accumulated from its pioneer work in this field. Discover for yourself how much you can save and gain by using this remarkable new blasting process.

Spencer's special bulletin, "Cut Blasting Costs With Spencer Prilled Ammonium Nitrate," and the most expert technical advice in the country are yours for the asking. Mail coupon today!

MAIL THIS COUPON

Spencer Chemical Company
Sales Supervisor,
Industrial Ammonium Nitrate
407 Dwight Building
Kansas City 5, Missouri

☐ Please send me free Spencer bulletin, "Cut Your Blasting Costs with Spencer Prilled Ammonium Nitrate."

☐ Please have a Spencer Technical Service Representative call—without cost or obligation to me.

Name_____

Company_____

Address_____

Post office_____ State_____

Prep. Facilities *(Continued)*

–Contract closed with Kanawha Mfg. Co. for plant addition, including lump picking and crushing facilities and means for making an additional stoker size. Heavy-duty, double-roll crusher capacity is 100 tph.

Cannelton Coal & Coke Co., Cannelton, W. Va.–Contract closed with Kanawha Mfg. Co. for fine-coal recovery system, including 12 Wemco Fagergren cells and one Eimco 8-ft 10-in by 9-disc Agidisc filter. Capacity, 30 tph.

Amherst Coal Co., Lundale, W. Va.–Contract closed with Kanawha Mfg. Co. for fine-coal cleaning plant, including eight Deister No. 77 Diagonal-Deck coal-washing tables to handle 190 tph of ⅜x0 coal, and four Heyl & Patterson 24-in cyclones for removing solids from circulating water.

Pocahontas Fuel Co., Inc., Jenkinjones, W. Va.–Addition of Ducon high-efficiency cyclone collectors to follow a 233-tph Fluo-Solids drying system as part of a contract originally closed with Dorr-Oliver, Inc., in 1957.

NEW SPEED AND DRILLING ECONOMY
WITH THE NEW IMPROVED

Parmanco

MODEL CD-51-57

COAL AND CLAY DRILL

- Augers Rotated by Vickers 21.5 H.P. Fluid Motor with Hydraulic Feed Finger Tip Controlled
- Cutting Shield And Guide Completely Automatic
- Drill Powered By 65 H.P. Water Cooled Motor.

Jack Foehrer, *Pit Foreman says*

"THE PARIS DRILL IS THE BEST WE HAVE EVER USED."

SEND FOR COMPLETE DETAILS

PARIS MANUFACTURING CO. PARIS, ILLINOIS

Equipment Approvals

Following approvals were issued by the U. S. Bureau of Mines during May.

Mountain State Equipment Co.—Rebuilt Joy 6SC7E-1 shuttle cars; three motors, 7½ hp each, 25 and 500 V, DC. Approvals 2-1357 and 2-1357A, May 13.

J. H. Fletcher & Co.—Model DAE roof-controlled drill; one motor, 25 hp, 220/440 V, AC. Approvals 2-1358 and 2-158A, May 7.

Gardner Denver Co.—Air compressor, Type WBH; one motor, 75 hp, 250 V, DC. Approval 2-1359, May 7.

J. H. Fletcher & Co.—Roof-control drill, Type DJB; one motor, 20 hp, 550 V, DC. Approval 2-1131A, May 7.

Jeffrey Mfg. Co.—Mining machine, Type MM70-URD; two motors, one 80 hp and one 38 hp, 440 V, AC. Approval 2-1360A, May 12.

Jeffrey Mfg. Co.—Loading machines, Models ML81AL and ML81BL; five motors, four 10 hp and one 4 hp, 250 V, DC. Approval 2-1361, May 14.

Long Co.—Conveyor drive unit, Models 400 and 500; one motor, 30 hp, 220/440 V, AC. Approvals 2-1362 and 2-1362A, May 15.

Columbus-McKinnon Chain Corp.—Conveyor, Model CF-2P; one motor, 10 hp, 230 V, DC. Approval 2-1363, May 15.

Jeffrey Mfg. Co.—Belt feeder, Model ME72-C; one motor, 5 or 6 hp, 250 V, DC. Approval 2-1364, May 20.

Wilcox Mfg. Co.—Miner, Model WCM-3ED-1; four motors, one 50 hp and three 5 hp, 230 V, DC. Approval 2-1365, May 21.

Jeffrey Mfg. Co.—Shuttle car, Model MT66; three motors, each 10 hp, 250 V, DC. Approval 2-1366, May 26.

Lee-Norse Co.—Miner, Model CM-37-1K; three motors, each 50 hp, 230 V, DC. Approval 2-1367, May 29.

Tennessee Coal & Iron Div., U. S. Steel Corp.—Roof Drill; four motors, 7½ hp each, 230 V, DC. Approval 2-1368, May 29.

Mine Safety Appliances Co.—Mine lighting system; two-wire, 230 V, AC. Approval 29-1A, May 7. Mine lighting system, three-wire, 230 V, AC. Approval 29-2A, May 7.

PAYHAULER FLEET

whips 17% grade with bonus loads

The Caldwell Engineers' five-unit 65 Payhauler® fleet highballs 2,500 cu yd of shot rock 1,000 feet daily up a haul road with 17% average grade. That's how this subcontractor keeps on schedule! His contract calls for excavating and crushing 165,000 tons of rock on the $13,000,000 hydro and flood control Oliver Dam under construction at Columbus, Ga.

Making the 17% grade with bonus loads is routine for the Payhauler fleet on this newest of all dams being built by the Georgia Power Co. at Columbus.

"These are crooked haul roads," reports excavation foreman Dudley Rabb, "but our Payhauler fleet is whipping them to keep us on schedule. The rigs haul through axle-deep water 50% of the time...make pull-outs up roads that rise 170 feet in 1,000 feet...yet speed bonus loads to crusher and stockpile."

Prove the get-away surge, and up to 25% faster haul speed of an International Payhauler—the result of bonus turbo-charged diesel power; road-matched and load-matched gear choice; and the power-cushioning leverage of planetary drive axles.

See how a Payhauler shortens the cycle with pick-up truck spotting ease. Discover how exclusive high reverse, zip-around power steering, and grade-beating power boost your profits. Try split-second dumping with the double-acting hydraulic hoist. Measure the advantage of Payhauler operating ease, and downgrade safety of positive Torqmatic braking! See your International Equipment Distributor for a demonstration!

International® Construction Equipment

International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.

Slamming through hard shale and sandstone material, this TD-24 is constructing a highwall 30 feet deep and a 40-foot-wide bench for augering. On a virgin operation, the TD-24 faces up to 300 lineal feet of bench daily! "Planet Power steering enables the TD-24 to cut extra highwall yardage per day," states Supt. Ken Ellis, Ford Mining Company, Charleston, W. Va. "Live power on both tracks pulls out full blades on a continuous move."

"TD-24 Planet Power steering gives us the 'live' power on both tracks while turning to work tough, muddy terrain where other crawlers could produce practically nothing," states Claude Reed, operator for Haun and Waters, Robins, Tennessee. "The TD-24 gives maximum production, plus operating ease." The shovel, dragline, and TD-24 "team up" to enable the big crawler to move about 50% of the clay and shale overburden —to build haul roads and clean coal, too!

From the heart of the nation's toughest coal-stripping areas, owners report:

"Our Planet Power-steered TD-24's decisively outstrip other king-sized crawlers"

Mullins and Mullins Coal Company, Dorton, Kentucky, use exclusive International TD-24 Planet Power steering to doze rocky materials, and "round" the curves from highwall or bench with bonus blade loads. They reposition TD-24's *doubly quick* by using finger-tip controlled high reverse. "TD-24's make you money by doing more work than other makes, and giving high reverse speeds to get around faster and push more loads," states Fomso Mullins. The Mullins firm owns three TD-24's. They get a yardage bonus of up to 40%—teaming TD-24's as shown in inset!

On this coal-stripping operation near Huntsville, Tennessee, TD-24's owned by Lloyd and Sherman Overton are shown teaming with power shovels to remove 50 feet of clay and shale overburden from coal seams 60 inches thick. "The live power on both tracks in turns enables TD-24's to move extra yardage, especially in the side-cut stripping operations," reports partner Lloyd Overton. That's a result of profit-boosting Planet Power steering!

Prove for yourself how Planet Power steering eliminates load-limiting "dead-track drag"—gives the TD-24 the same enormous capacity on turn or straightaway. See how you can "equalize" track speed to steer straight with heavy offset loads. Add up the extra "pushes" per day that exclusive, minute-saving TD-24 Hi-Lo shifting (forward and reverse) gives you! Ask your International Construction Equipment Distributor for a demonstration!

International® Construction Equipment

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A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

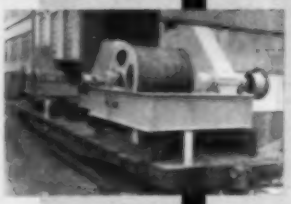
A MILE - STONE ..... OF ...

50 YEARS

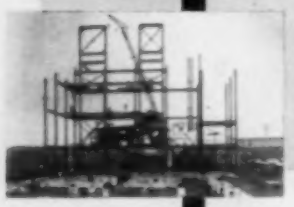
1908
1958

RESEARCH

ENGINEERING



MANUFACTURING



CONSTRUCTION

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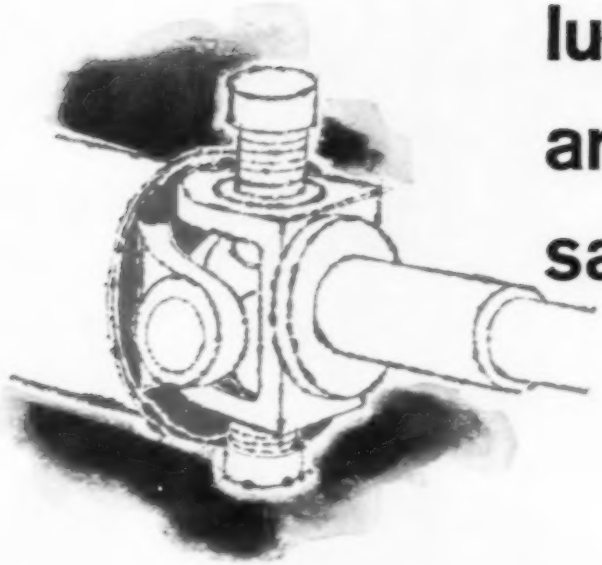
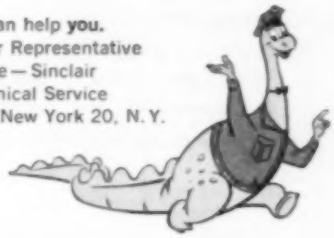
Universals... lubrication... and how to save money



Sinclair Litholine® multi-purpose grease replaces 3 different ordinary greases—chassis, wheel bearing, water pump. It therefore cuts unnecessary inventory costs. Furthermore, it eliminates the danger of misapplication. This superior lubricant has earned a reputation for lengthening lube intervals—prolonging life of universals and other vital parts. Change to Litholine, now. And when management asks how you've cut costs, tell them you've switched to Sinclair— and show them the results.

Find out how Litholine can help **you.** Call your nearest Sinclair Representative or write for free literature—Sinclair Refining Company, Technical Service Division, 600 Fifth Ave., New York 20, N.Y. There's no obligation.



SINCLAIR
Litholine®
Multi-Purpose Grease

More tonnage . . . more profits

50% Higher Tonnage with the *new* CM37

For medium and high seams

Backed by the tried and proven cutting principle of the original Lee-Norse Miners, the CM37 brings a new high in operational efficiency to continuous mining. This rugged machine has more power, more capacity and higher tramming speed that results in increased tonnage per man shift.

Check these NEW FEATURES!

1. Total weight 25 tons—a 25% increase! Extra weight mostly in improved cutter head where it does the most good!
2. More power—fewer motors! Only 3 identical electric motors used . . . conservative continuous ratings . . . no water cooling.
3. Heavy duty electric control.
4. 14" wide crawler treads with improved hydraulic motor and gearing.
5. 24" wide conveyor driven by hydraulic gear motors applied directly to gathering head. Hydraulic start and stop . . . no clutch required.
6. Multiple tramming speeds—variable speeds to 50 feet per minute . . . fast tramming at 90-100 feet per minute.
7. Increased capacity...4 to 5 TONS PER MINUTE.

Coal high or low? . . .

. . . with Lee-Norse MINERS

For Low Coal . . .

LCM28

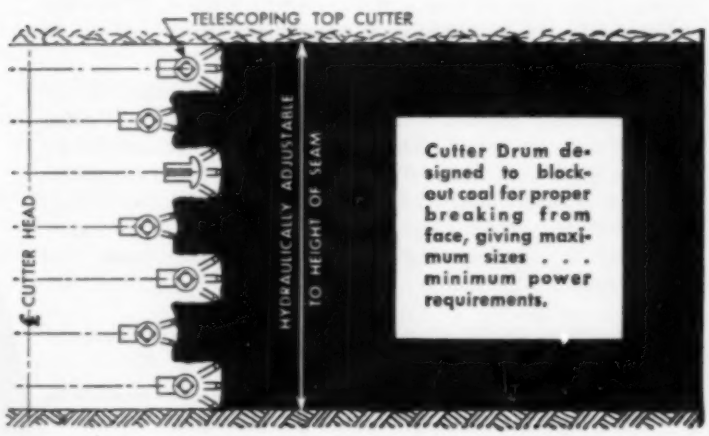
ready for production!

For seams 30" to 48"

Here's how LCM28 *produces profitable tonnage!*

1. Weight 16 tons — rugged and heavy enough to cope with tough cutting conditions.
2. Capacity—2 to 3 tons per minute.
3. Hydraulically driven 24" flexible Conveyor.
4. Two Cutter Heads cut a wide face 16 feet or less.
5. Dual gathering arms have maximum reach of 11 feet . . . will gather ALL the coal regardless of position.
6. Controlled Tramming Speed gives proper sumping action and Dual Pump combination gives high tramming speed.
7. Especially good in cross-cut development!

The LCM28 "Low Coal" Miner employs a new combination of cutting and gathering coal. The vertical mounted extendable cutter drums arc together like a "clam shell."

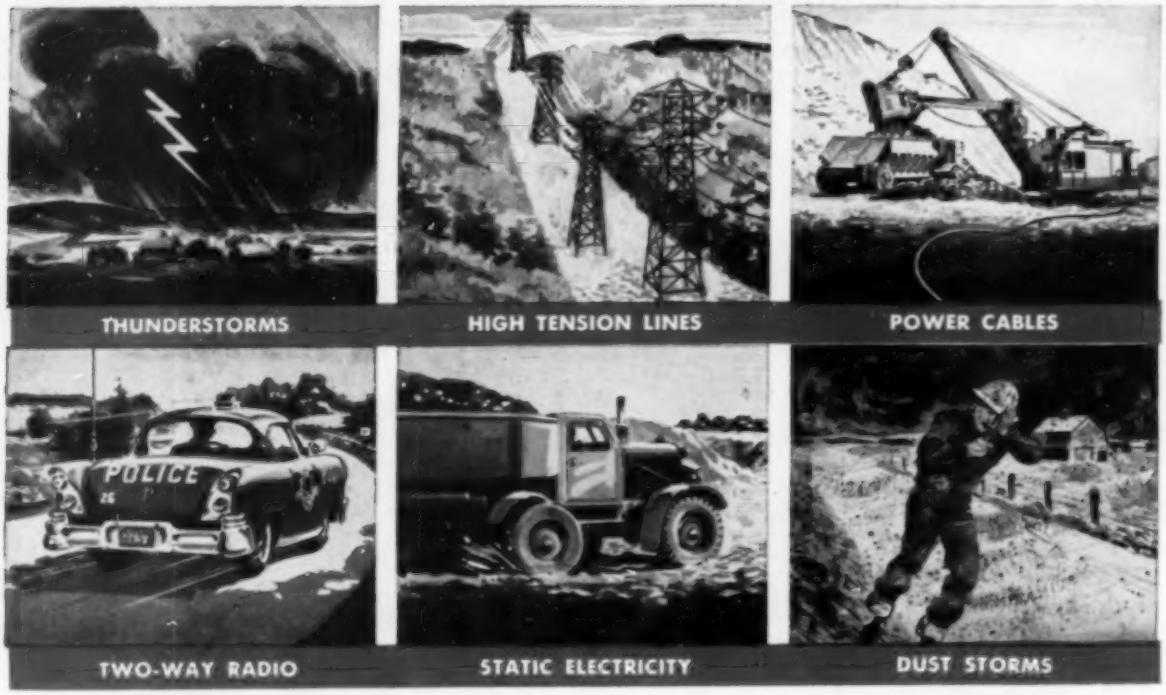

TELESCOPING TOP CUTTER
CUTTER HEAD
HYDRAULICALLY ADJUSTABLE TO HEIGHT OF SEAM
Cutter Drum designed to block-out coal for proper breaking from face, giving maximum sizes . . . minimum power requirements.

All Lee-Norse Miners are available in AC or DC power.

Lee-Norse Company
CHARLEROI, PENNA.
Specialists in Coal Mining Equipment

Lee-Norse MINERS keep production on the go!

Guard against these stray current hazards!



Hook-up and detonate with Primacord!

Blasting authorities recommend the use of Primacord wherever extraneous electricity may be encountered. These unwanted electrical currents can be caused by lightning several miles away — by static due to moving belts, automobile tires, dust storms and even snow storms. Two-way radios, high tension lines and power equipment cables all present stray current hazards.

With Primacord as the detonating agent, you can load and fire when ready without danger from stray currents. Primacord is relatively safe to handle and store. It cannot be set off by *normal* vibration or friction, ordinary impact or sparks, but must be detonated with fuse and cap or electric blasting cap. It is not affected by stray electrical currents, and — according to all available records — has never been fired prematurely by lightning.

Your explosives supplier can give you further information and service. Use coupon for a free copy of the Primacord Sample Kit.

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Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

COAL AGE

JULY, 1958

IVAN A. GIVEN, EDITOR

Only a Pause

COPING WITH depression problems naturally tends to engender a somewhat skeptical approach to forecasts of future progress. Yet that progress is inevitable and depressions are at the worst relatively short in comparison with periods of prosperity. Thus once again the economy of the United States is down but once again also the future is one of growth unparalleled in the history of the Nation.

GNP in 1975

The latest picture of that growth, which reflects rising population and equally, if not more important, a continually rising standard of living, is provided by a copyrighted study issued in May by the McGraw-Hill Department of Economics. Its title: "The American Economy—Prospects for Growth to 1965 and 1975." Its basic conclusion: The total output of goods and services, otherwise termed the "gross national product," will nearly double by 1975, rising from $434 billion in 1957 to $835 billion in 1975 in terms of 1957 dollars.

Key Factors

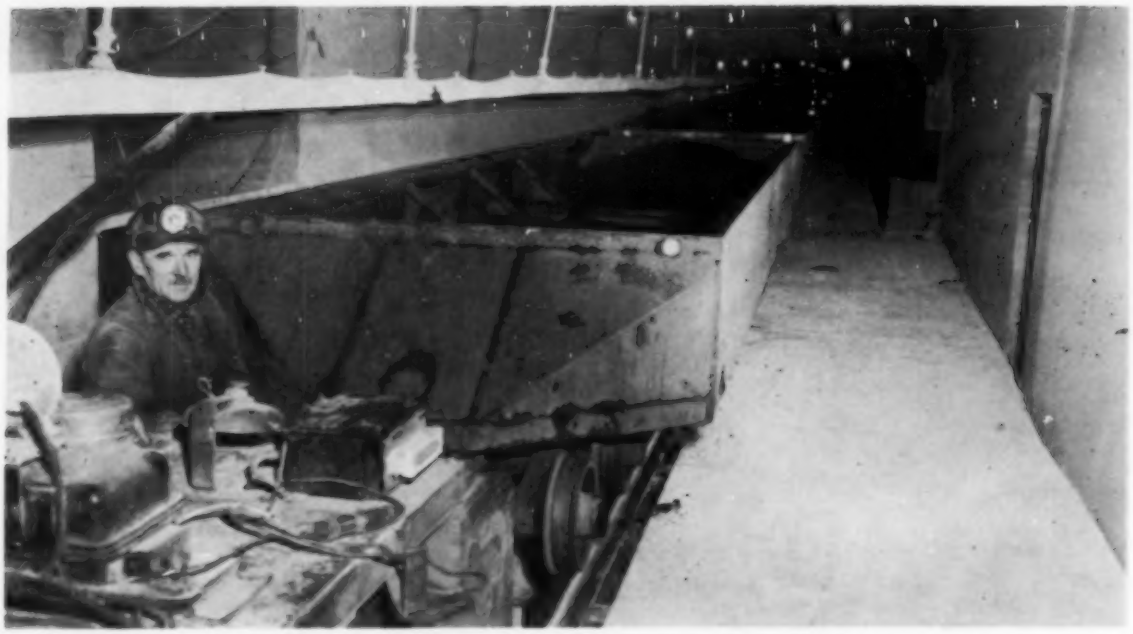
Key factors in this expected increase in gross national product include (1) more people—235 million in 1975 compared to 171 million in 1957; (2) more workers—88 million against 65 million; (3) and a higher productivity per worker—$5.14 output per manhour in 1975 against $3.29 in 1957. Hours of work will drop from 39 to 35.5 per week. Even in the shorter run, the size of the economy will increase materially. In 1965, gross national product is expected to reach $581 billion, compared to $434 billion in 1957.

No Mineral Shortages

Changing technology, reflecting major increases in research and development, is a vital element in the future picture. "The greatest impact of new products and new processes . . . will be felt in the mid-60s, reflecting the stepup in research spending that began in the mid-50s." But there is one condition—no crippling shortages of basic resources over the next two decades. These basic resources are of course the metals and minerals, and the authorities in these fields see no lack of these in the period in question.

Coal in 1975

Fuel and power, the report notes, will come mostly from present sources—coal, oil and natural gas, with nuclear power climbing to 5% of the generating capacity by 1975. "Up to 1975," however, "the main effect of the rise in power generation on fuel demand will be to increase coal requirements of the power industry. These may go up 150% by 1975, even with improved burning techniques." A 175-million-ton steel rate in 1975, compared to 113 million in 1957, means expansion for coal in another direction. And so on, pointing up once more the basic fact that the present depression in coal is only a pause in the upward climb to 750 million tons or more in 1965 and 1 billion or more in 1975.



BIG MINE CARS **DROPBOTTOM CARS,** 30 ft long, are pulled across 325-ton bin without stopping. Car capacity is 13½ tons. If a car door fails to reclose, an automatic warning device alerts motorman.

$1 Million Modernization Pays Off at

Mine productivity gets big boost with revamped haulage system and barge-loading facilities. Flexibility in mining methods to meet irregular seam conditions adds to over-all efficency at western Pennsylvania operation.

FLEXIBLE MINING **CONTINUOUS MINER** and pickup loader set the pace in pillar extraction. Bolting is systematic.

A 50% REDUCTION in haulage costs, a 29% boost in over-all productivity and smoother, safer transportation from face to barges are top gains resulting from a $1,000,000 modernization program at Harmar Coal's Oakmont mine. From the section to the river Oakmont's haulage and coal handling system has a new look. Producing 3,300 tpd (raw coal) in two shifts, Oakmont received a new lease on life when an adjoining coal tract was added to increase coal reserves. This addition justified undertaking the modernization program with ensuing benefits.

Today coal is loaded into big 30-ft dropbottom mine cars handled at the loading ramp by hydraulic car spotters. It travels to an automatic dump on all-welded 80-lb track, is crushed to 3x0, elevated to the surface and loaded into barges. All of this is done with only six men per shift—two motor crews of two men each and two barge-loading men.

The present system was developed after carefully studying the existing facilities and then setting up a definite plan for modernization. Because of the limited surface area along the

NEW BELT SLOPE **NEW SLOPE** with 36-in belt provides link between underground bin and barge-loading facilities.

Harmar's Oakmont Mine

river, a complete new bottom layout and surface plant could not be considered. Any modernization was therefore restricted to altering existing underground headings, keeping in mind that the mine would be producing coal during the construction work. A nearby heading parallel to the existing bottom layout therefore had to be selected for the new coal-dumping point. This new site then left the company with the choice of revamping the existing slope for a belt installation or sinking a new haulage slope.

After carefully exploring the advantages and disadvantages of the two slope alternatives, the company decided to sink a new opening. Bid prices were equal for the new slope and for the remodeling job because of the uncertainties in remodeling. All the design work, fabrication and erection for the new portal, slope belt and barge-loading facilities were handled by the Pittsburgh Industrial Engineering Co.

Since revamping the haulage system and purchasing new large mine cars were a major part of the modernization program, all factors that might influence the cost of construction, operating labor and supplies were considered before choosing a car. For example, estimates of excavation and concrete costs for a car haul and bin for rotary, and a bin for dropbottom cars were found to be equal. Hence no choice could be made on this basis.

Total equipment costs were greater for a rotary-dump installation than for a dropbottom setup. In this instance, 5,700 ft of track and 19 turnouts were needed for the rotary dump, compared to 2,300 ft of track and four turnouts for a dropbottom installation.

The company wanted to use the largest mine car possible under the natural conditions. This led to setting up the following basic car specifications: 30 ft long, 7 ft wide, 48 in high and capable of traveling on a No. 2½ turnout. With these dimensions a solid-body unit could have a capacity of 630 cu ft and a dropbottom 412 cu ft.

To provide the necessary surge capacity while hauling coal 1½ to 2½ mi for the first 4 to 5 yr of operation, estimates indicated that 10% more dropbottom cars would be needed. Initial cost of the dropbottom cars and maintenance were higher, but some of this was offset by the greater estimated maintenance for a rotary dump and car haul. To install an automatic rotary dump would involve redesigning the mine bottom and would result in such cramped conditions that it was rejected. On the basis of the total savings in capital expenditure and operating costs, the company chose the dropbottom installation.

Designing the Car

Several modifications to existing mine-car design were incorporated in the dropbottom cars. The final design was the result of cooperative efforts between engineers of Sanford-Day, the manufacturer, and the Harmar Coal Co. Maximum capacity of the cars is 13½ tons. Truck frames are standard National Malleable units.

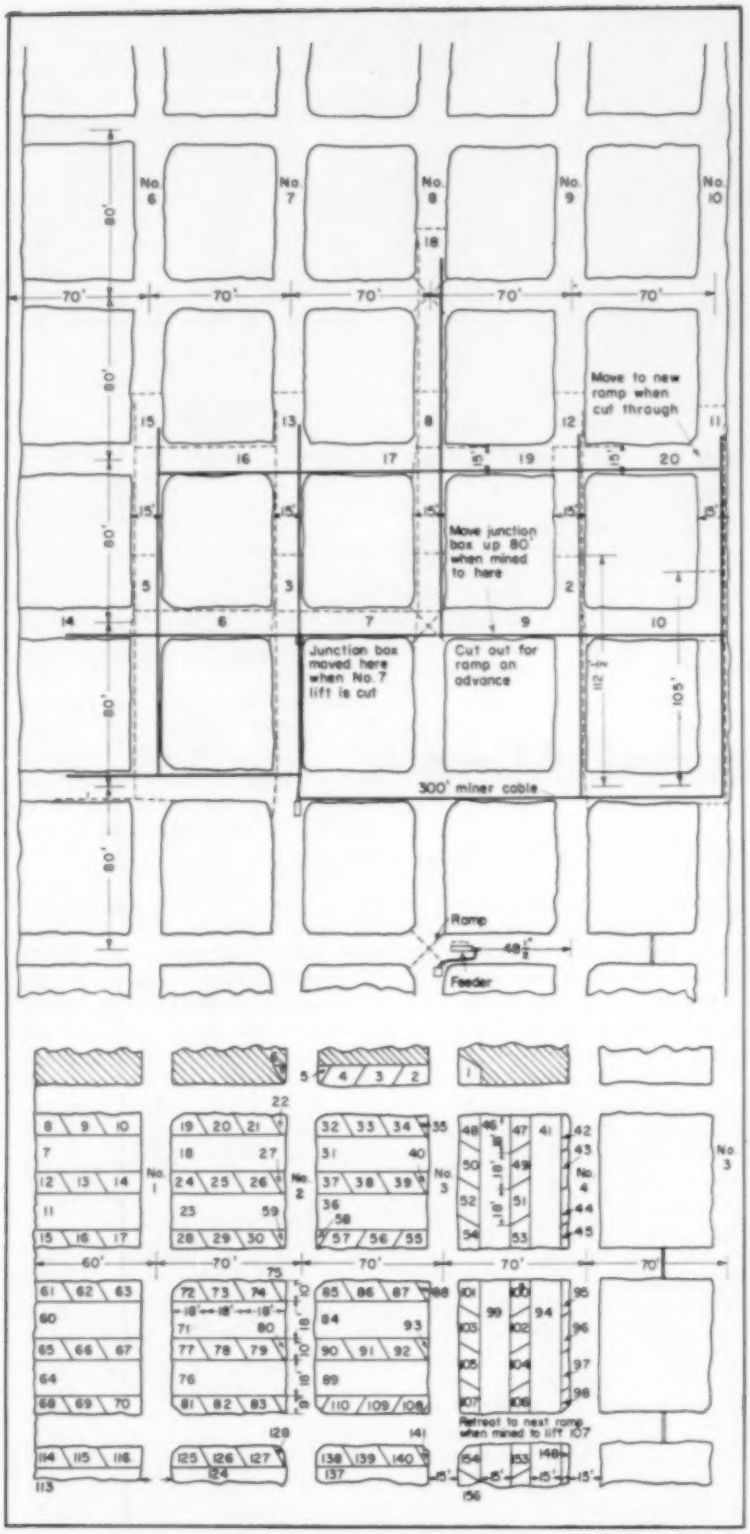
Cars are fitted with two car-haul lugs, spaced one-half car length apart. This permitted the length of straight track needed for hydraulic car spotters to be cut to 24 ft, compared to 39 ft for cars having a single lug.

Cars will have been in service 2 yr in June 1958, and maintenance has been negligible. There has been very little wheel wear and no wheels have been replaced. The center pin is lubricated every 6 mo with Brooks Leadoline and once each year all wheels are greased. This greasing schedule was set up by taking several cars off the road, jacking them up and removing the trucks to inspect the wheels and center pin.

The Haulage System

All track in the new bottom layout consists of 80-lb electrically welded rail laid on 5x7-in Osmose-treated ties on 22-in centers and ballasted with 1½x⅜-in slag. These same standards are used for all new main-line track.

Secondary track includes 40-lb rails on Bethlehem No. 5-section steel ties with depressed ends. Loop haulage is employed in the sections to simplify car changing and to permit uninterrupted loading. Mine cars are moved by the loading ramp with a Nolan or Stamler hydraulic car spot-



MINING SEQUENCE in both development and pillar extraction is designed to keep shuttle-car hauls to a minimum. Loading ramps are moved every 160 ft. Pillar-recovery method includes cutting through blocks at 90-deg angle. Protecting wing on gob side is removed on retreat after lift cuts through.

ter which is operated by the shuttle car driver.

Two locomotive crews per shift handle all mine cars between the section and the underground bin. Crews consist of two men each of whom operates a Goodman 13-ton locomotive at each end of the trip. This method eliminates the need for having locomotives run around trips.

To simplify communication and dispatching, all locomotives and other units regularly using the mains, and each section loading point are equipped with MSA Minephones. Haulage crews are posted as to the loading progress in each section and can vary their schedules to meet the section loading rates.

As a trip of loaded cars moves across the dump, the motor crews do not have to worry about stopping to position the door-tripping dogs. This job is done electrically by a Cheatham directional switch on the trolley wire. As a locomotive enters the dump with loads, the directional switch is hit, operating a reel motor salvaged from a locomotive. The reel motor operates a mechanism that depresses the dogs. When a locomotive moves in the opposite direction, the directional switch is hit again, returning the dogs to the tripping position.

If for any reason one of the doors on a dropbottom car should fail to reclose at the dump, a warning light flashes and a loud horn sounds ahead of the locomotive. This warning system operates from a 30-ft section of rail placed between the track and energized at a very low voltage. If a door fails to reclose it makes contact with the third rail and the regular rails and thereby closes an electrical circuit to the warning light and and horn. Thus a motorman can be warned to back up and reclose the door before leaving the dump.

To prevent wrecks at turnouts, from doors dropped in transit, guard rails are installed in the center of the track at all switches. The length of each guard rail varies with the size of turnout. For example, a No. 2½ turnout requires two guard rails 9 ft long and one 14 ft. A No. 5 turnout needs two 13-ft and one 45-ft guards. With guard rails and the automatic warning device at the dump, the company reports that wrecks caused by dropped doors are virtually eliminated.

Proof that the new haulage system

AUTOMATIC movement of dogs at car dump is achieved with electrical switch on the trolley wire ahead of dump. A salvaged locomotive-reel motor connected to the switch operates a mechanism that depresses the door-tripping dogs.

and barge-loading facilities are paying off can be seen by comparing the mine productivity for 6 mo before and after the modernization. Raw tons per man on the payroll jumped to 14.3 6 mo after the modernization program, up 29% from the 11.1 average for the pre-modernization period.

Flexible Mining Methods

Mining is in the Thick Freeport seam which has some several local grades running up to 12 to 18%, and also some irregular areas of thin coal. Because of these irregular conditions, the company maintains a high degree of flexibility in equipment and in mining methods, using both continuous miners and conventional units.

Development is assigned to conventional equipment, including the following units: two Jeffrey 70-URB universal cutters with 9-ft bar, Cincinnati chains and Kennametal bits; two Joy 11-BU loaders; three Joy 10-SC shuttle cars, and two Fletcher roof-bolters using Carboloy bits. Each cutter and bolter also carries a Schroeder hydraulic coal drill with Kennametal augers and bits.

All the above equipment is not operated at one time but is kept on the section to provide the greatest possible flexibility in the operation. The crew assigned to the development section includes 12 men whose regular duties are: one loader operator, two shuttle car operators, two cutter operators, two combination cutter, loader and shuttle-car operators, one shotfirer and one foreman. Spare equipment is kept at the face and is used as needed, some of it each shift. For example, instead of making long equipment moves, men move to the spare machines which are spread throughout the working area. The shuttle cars are the only units that move over the entire area.

One loader, two shuttle cars, one cutter and one roof-bolter are always in operation. The combination men provide the flexibility for the section. They usually start the shift by cutting several places and then switching to the spare loader and shuttle car for the remainder of the shift.

Cutter crews top cut and shear the left rib and place five shot-holes in two rows. The two upper holes are spaced 4 ft apart, starting 4 ft from the shear and immediately under a bony band in the coal. The three lower holes, also 4 ft apart, are started in a row 1 ft from the right rib and 8 in above the bottom. Five sticks of duPont Monobel are used in each top hole and six in each bottom hole. Holes are tamped with permissible Perma-Seal tamping plugs and fired one at a time.

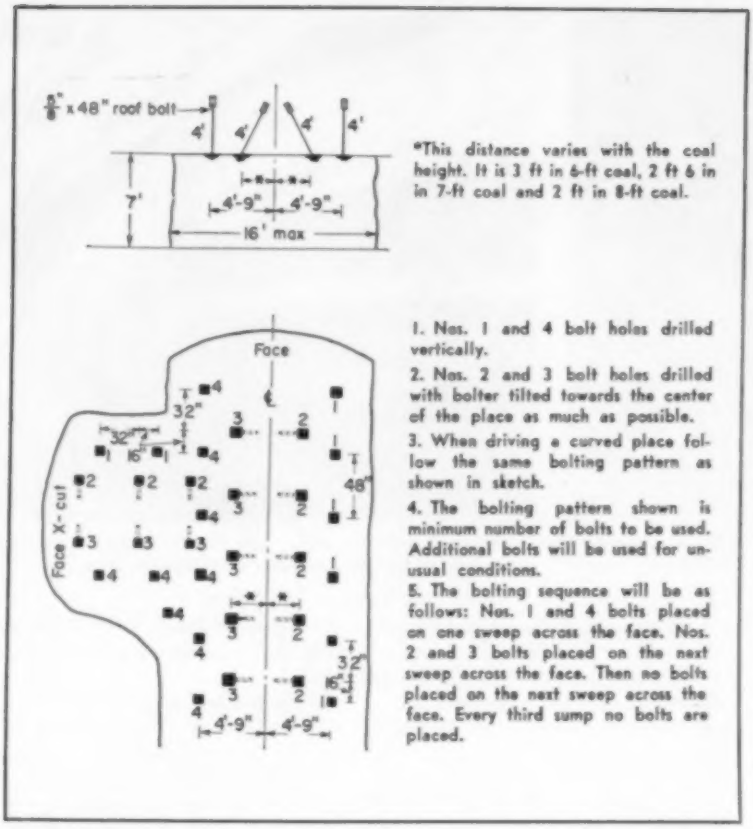
Main headings are driven 14 ft wide on 60-ft centers, with breakthroughs every 80 ft. To keep shuttle-car hauls to a minimum, track loops are moved up every 160 ft. Shuttle cars carry coal to a loading ramp in either No. 4 or No. 5 heading where it is discharged into the big dropbottom mine cars traveling on loop haulage.

Each loading point has a wooden car-leveling bar that spreads coal evenly and prevents later spillage along the haulage road. The bars are mounted in adjustable steel supports secured to Duff Norton or Simplex roof jacks, and can be taken down and moved to a new loading point in a few minutes.

The company uses roof jacks for several other applications to simplify operations and speed moving. For example, temporary doors are mounted on jacks; cable anchors consist of a roof jack and an old rubber tire; mine phones are supported on jacks and MSA Bantam rockdusters are hung by four chains from a steel rail supported by two jacks. A shuttle car can move under the rockduster and raise its boom to meet it. The rockduster can then be released from the overhead support. Lifting the unit into the shuttle car is eliminated and a storage place is provided.

Continuous Mining

Continuous miners produce coal both in secondary entry development and barrier pillars in old areas of the mine. In development work, five headings are advanced according to a plan established by the company's engineers. This includes driving the openings in definite sequence to keep equipment moves to a min-


⅝" x 48" roof bolt
4'
4'
4'
4'
7'
4'-9"
4'-9"
16' max
*This distance varies with the coal height. It is 3 ft in 6-ft coal, 2 ft 6 in in 7-ft coal and 2 ft in 8-ft coal.
Face
Face X-cut
32"
32"
16"
48"
32"
16"
4'-9"
4'-9"
1. Nos. 1 and 4 bolt holes drilled vertically.
2. Nos. 2 and 3 bolt holes drilled with bolter tilted towards the center of the place as much as possible.
3. When driving a curved place follow the same bolting pattern as shown in sketch.
4. The bolting pattern shown is minimum number of bolts to be used. Additional bolts will be used for unusual conditions.
5. The bolting sequence will be as follows: Nos. 1 and 4 bolts placed on one sweep across the face. Nos. 2 and 3 bolts placed on the next sweep across the face. Then no bolts placed on the next sweep across the face. Every third sump no bolts are placed.

BOLTING PLAN in continuous mining areas requires that vertical and angled expansion-type bolts be set no more than 4 ft apart.

imum. Headings are on 70-ft centers and breakthroughs are spaced 80 ft apart. As in main-entry development, loading ramps are moved up every 160 ft. Details of the continuous mining plan are shown in an accompanying sketch.

Pillars are taken out one at a time by driving 18-ft lifts through to the gob and leaving a 10-ft fender for protection. After the lift holes through, the 10-ft protective pillar is taken out in three 18-ft cuts. If a stump can not be extracted completely it is drilled with a Chicago Pneumatic handheld drill and then broken with explosives.

Roof bolts are installed with two Fletcher roof-bolters mounted on the continuous miners. Two 4-ftx5/8-in high-tensile Bethlehem bolts with Ohio Brass expansion shells are set for each 18-in advance of the Joy continuous miner. One bolt is angled over the machine and the other is installed vertically. The two bolters alternate installing vertical and angled bolts. As the dust falls from the drill hole it is gathered by an MSA bucket-type collector that fits around the auger at the mouth of the hole. The collector is emptied after a hole is completed.

Equipment in a continuous miner section includes a Joy 1 CM continuous miner with two Fletcher roof-bolters, Joy 11-BU or 14-BU loader, 10-SC shuttle car and Nolan car spotter. The section crew includes one continuous-miner operator, one loader operator, two bolters, one shuttle-car operator and one foreman, or a total of six.

Average production with continuous miners in normal conditions is 43.6 tons of clean coal per face man. Conventional sections average 27.7 tons per man shift.

Once each day during the working shift the continuous miner is completely lubricated. This job is speeded with a hydraulically powered grease gun mounted on the machine. Equipped with 50 ft of hose, the grease gun can reach all parts of the miner. Units are serviced with Hulburt AP 5 and Sun lubricants. Shuttle cars are lubricated automatically with Lincoln systems.

Power

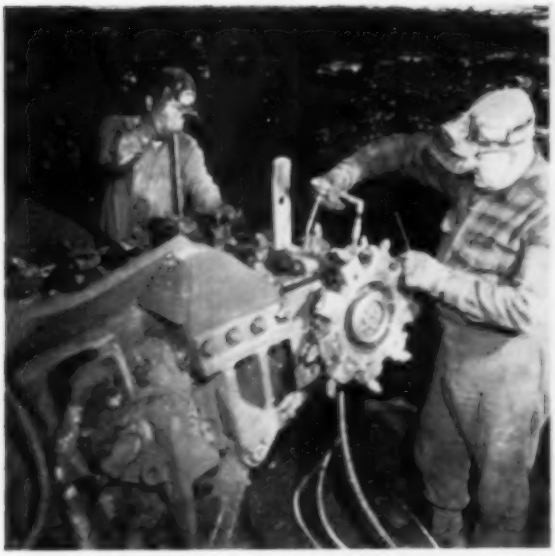
Energy is purchased from the Duquesne Light Co. at 2,300 V and transmitted to five underground substations, including one Westinghouse 300-kw rectifier and four General Electric and Westinghouse 200-kw m-g sets. Additional power is provided by a 300-kw m-g set located in the lamp house. Each continuous miner is serviced by one of 200-kw m-g sets and the rectifier takes care of the conventional equipment and a spare section.

To simplify testing of underground cable there is an oil switch at the bottom of each borehole and every 1,000 ft there is a shanty in which there are disconnects. Thus it is a simple matter to test each 1,000-ft section of cable in event of a failure.

All underground substations are fireproof and each substation has an automatic panelboard mounted on wheels for easy moving. The electrical diagram for the substation and panelboard is posted in each substation. Each station also is provided with a hot stick and rubber gloves so that an electrician can disconnect the high-voltage power safely.

The company has developed an ingenious arrangement for automatically closing the two steel doors on the substation building. The main two-section door is mounted on rollers that travel on an inclined track permitting the door to close by gravity. At the back of the substation building is a small hinged regulator door. The two doors are held open by two pieces of thin rope, which are joined by a fuse link at a point over the substation. If the temperature in the building should rise to the melting point of the fuse link, the doors would be released and close automatically. Thus any fire would be confined inside the fireproof building. Each substation also is equipped with an air-pressure switch that disconnects the unit if the fan stops.

Circuits carrying 250 V DC from the substations to underground equipment include either 1,000,000-cir mil copper or 1,600,000-cir mil aluminum positive and negative feeders to the



LUBRICATION of continuous miner is speeded with high-pressure gun mounted on machine. Gun has 50 ft of hose.

MOBILE WORKBENCH is provided for each working section. Each shift has a separate compartment for tools and small parts.

working areas. In areas where 80-lb welded track is installed, the company uses both rails and a 500,000-cir mil cable for the return.

Oakmont mine relies on a Jeffrey 8-ft Aerodyne fan to supply fresh air to working areas. Operating at a 2-in water gage, the fan delivers 225,000 cfm. It is driven by a 2,300-V 150-hp Crocker-Wheeler motor and has a 100-hp standby motor.

Each section is on a separate split of air, except the Mains which have two splits. Permanent stoppings are made of solid concrete blocks put together with ready-mixed concrete to which only water is added.

Drainage

Mine drainage is planned to use automatically controlled pumps wherever possible. Where water is encountered in the working sections, upright Hazleton turbine pumps are used to relay it to local sumps. From there, Gorman-Rupp units relay it to the main sump where a 500-gpm deepwell turbine unit picks it up and delivers it to the surface through a 6-in pipeline. The company also has a 350-gpm manually operated centrifugal unit that discharges through a borehole.

Aside from the pumps inside the active workings, there are two deepwell pumps located on the surface to tap bodies of water in old works. These are controlled automatically with timing devices. Large pumps include LaBour and Marlow units.

Harmar Supervisors

Ralph Ison, general superintendent, Oakmont and Harmarville mines.
Charles H. Butera, superintendent, Oakmont mine.
J. H. Anderson, general mine foreman.
C. A. Kirkpatrick, master mechanic.
Robert Hargest, chief clerk.
C. A. Armstrong, supply clerk.

Safety Incentives

Promoting safe work habits among all employees is a continuing program at Oakmont. In the past year, the company sponsored weekly safety training classes which were taught by the U. S. Bureau of Mines. For 15 min at the beginning of each shift the men gathered for the safety sessions. These were held for 58 weeks.

To maintain a high level of interest in safety, the company has an incentive plan for all employees. For example, if all shifts of a section go a full month without a lost-time accident each man receives an award. This may be a pair of gloves or similar useful article.

If the entire mine averages 50,000 man-hours per lost time-accident for a full year, everybody receives a turkey. The men have earned turkeys for the past 3 yrs. Any foreman whose men go a full year without a lost-time accident also receives an award.

Mine management cooperates closely with the local safety committee of the UMWA to promote safety. They meet once a month in an informal atmosphere to review the safety record and plan new campaigns.

All of Oakmont's employees, from the superintendent on down, have taken the USBM safety training course which was taught by Joseph Yanity. To maintain a high level of interest, the company sponsors an annual 2-hr refresher course in safety. Sessions are held for each shift and valuable door prizes are awarded. These include TV sets, fishing rods, power tools and rifles. A minimum of one prize is provided for each shift.

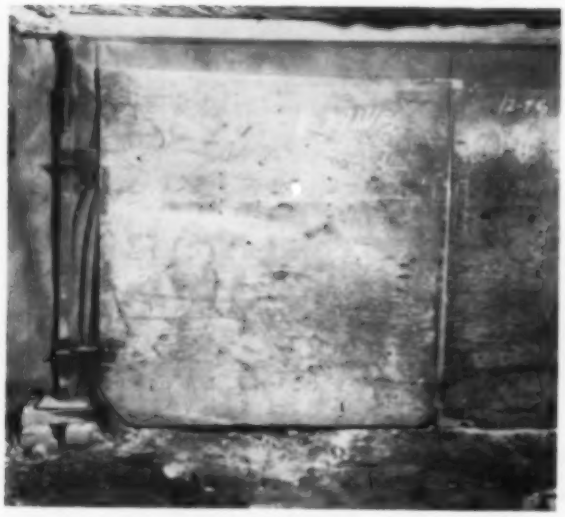
Each year the company also runs a 6-hr first-aid course. This is a review of basic material and is taught by a representative of Harmar's safety department. The goal is to prevent accidents but if there should be any, management wants the men trained to administer first-aid properly.

The effectiveness of the safety program is reflected by the few lost-time accidents at the property. For the past 6 mo there has been no lost-time accident, and during the

Support adjustable car-leveling bar

Provide cable anchors

Roof jacks fill many jobs at Oakmont . . .



Support double-acting doors

Simplify loading of rockduster

full year of 1957 there were only five.

Another phase of the Oakmont safety program is providing equipment for fire-fighting and training foremen in fire-fighting techniques. A special car equipped with all types of fire-fighting tools and material for laying a water line quickly is kept ready for action. Carboloy tanks with 200 ft of hose are stored on a truck at the slope bottom and can be transported to a fire in a matter of minutes.

All foreman are drilled twice a year in putting out a mine fire, including working with smoke masks. A fire is built outside the mine and and the men must put it out with the same type of equipment available underground. The company also sponsors and equips a mine-rescue team. Once a month this group meets to keep proficient in the use of the equipment.

Underground Shop

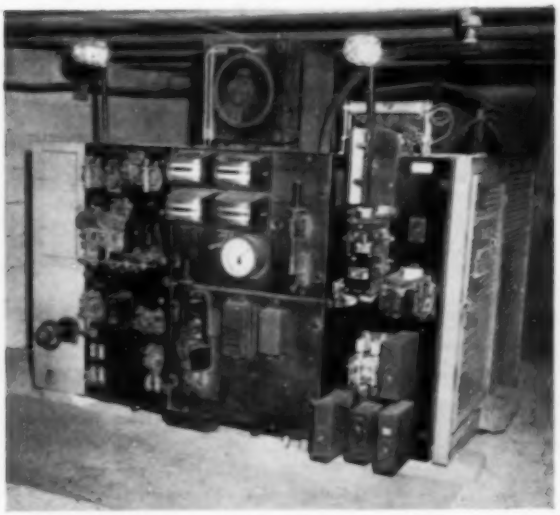
An underground shop that will include facilities for overhauling all equipment is now under construction. When completed, it will have a special repair area for locomotives, shuttle cars, loaders and continuous miners. Plans also call for installation of a hydraulic-repair center equipped with a Schroeder test board. The shop will have both AC and DC power.

Underground mechanics are assigned four Lee-Norse Jitneys to travel about the mine. These units are built low so that heavy parts can be lifted in or out with a minimum effort.

Flow to Barges

The dropbottom mine cars dis-

LOW SLUNG personnel carrier assigned to maintenance men eases loading and unloading of heavy parts.



AUTOMATIC panelboard for substation is wheel-mounted for fast, easy moving. Wiring diagram is placed with each unit.

charge coal into a 325-ton underground bin. A Syntron vibrating feeder then delivers the coal to a McLanahan & Stone 30x60 rock-type single-roll crusher, where it is broken to 3x0. The crusher product drops onto a 60-in transfer belt equipped with Link-Belt idlers and flows 25 ft to the 36-in slope belt equipped with Stephens Adamson idlers.

Suspended directly over the transfer point is 54x54-in Stearns magnet that removes tramp iron. This unit is motorized for both hoisting and trolleying so that it can be moved quickly to drop tramp iron and return to position.

Coal is transported 816 ft on Goodyear 4-ply super Cordura belt and elevated to a two-bin structure at the river dock. One bin holds 130 tons of coal and the other 150 tons of rock. A Syntron vibrating feeder discharges coal onto a 36 in conveyor equipped with Goodyear 5-ply 28-oz Style B belt. It then flows 80 ft to a barge-loading chute.

Mine rock follows the same flow from the underground bin and is discharged into the 150-ton rock bin. One of the men of the barge-loading crew hauls rock dumped on his shift to a disposal area ½ mi away.

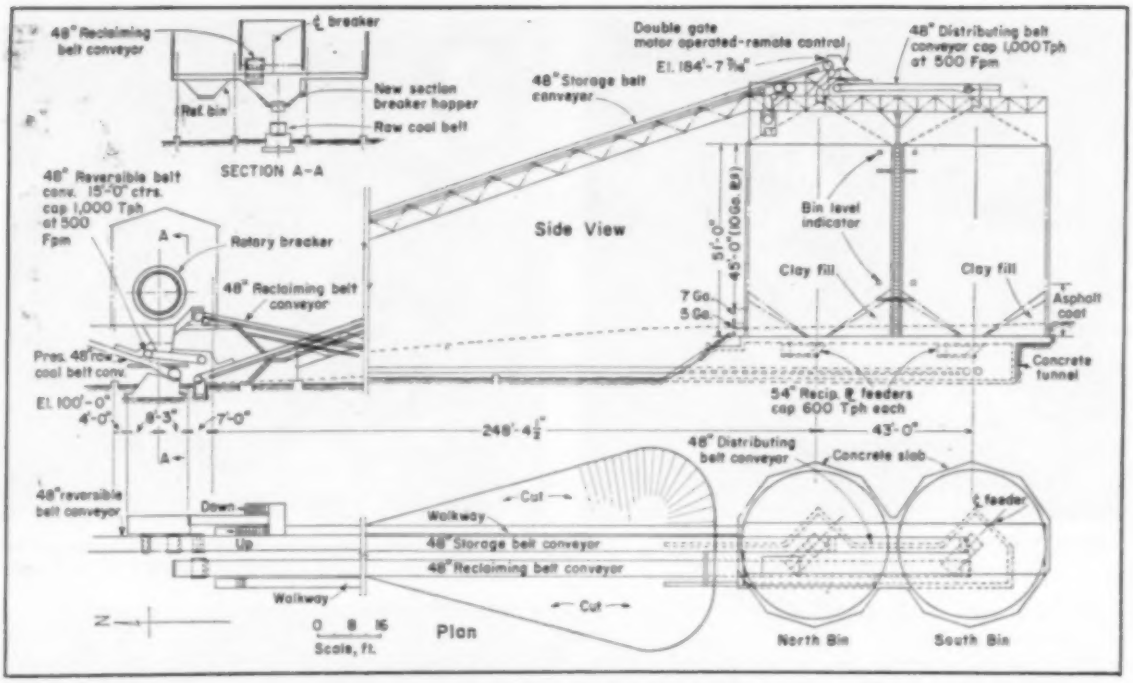
SURFACE FACILITIES include 130-ton coal and 150-ton rock bins, belt conveyor to barge chute and control center. Plant is designed for simplicity of operation.

Plant Operation

The entire plant, from underground bin to barge, was designed for simplicity of operation and maintenance. For example, two men operate all equipment from controls at the barge-loading chute. Strategically located safety devices prevent damage to equipment from spillage or pile-up of coal. These include centrifugal switches on all belt tail pulleys and limit switches at all transfer points. To eliminate the possibility of spillage, all belt conveyors are in a straight line, that is, with no vertical curves.

Ease of cleaning the plant rated top consideration in designing the new installation. To prevent accumulations of fine coal, all intermediate floors are metal grating. The entire plant is piped with wash lines with outlets for ¾-in hose spaced so that any point in the plant can be reached with 50 ft of hose. To permit washing down the slope a 2-in pipeline doubles as a water line and handrail.

The two men who operate the barge-loading facilities are responsible for cleaning a section of the surface plant on their shift. They have ample time for hosing down their section each day. A utility man on the third shift is responsible for any maintenance work and cleanliness of the slope and bottom installation.



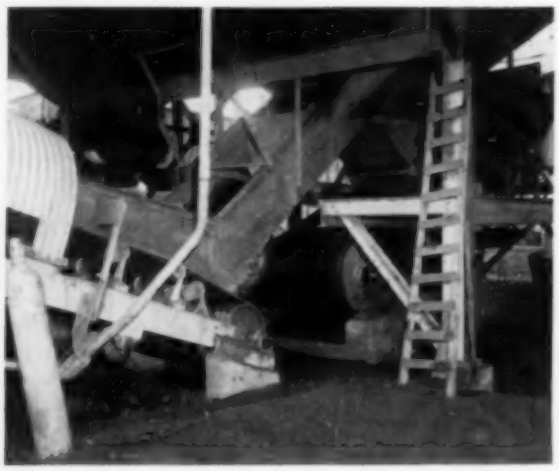
STRUCTURAL STEEL supports corrugated tunnel-liner plate to form storage bins. Concrete slab under bins also serves as roof of reclaiming tunnel, in which two heavy-duty feeders are installed.

Raw-Coal Storage Bins Lead To

Storage capacity for 3,000 tons provides cushion between cleaning plant and field operations to eliminate many causes of plant delays. New large trucks permit two-shift loading for added economies.

AN INCREASE of 1,000 tpd of marketable coal loaded at the cleaning plant . . . This is the measure of the boost in efficiency achieved at Enos Coal Mining Co., Oakland City, Ind., through the addition of raw-coal storage facilities and the purchase of new,

STORAGE AND RECLAIMING CONVEYORS (left) terminate under rotary breaker which receives coal from hopper.



RAW COAL from rotary breaker can be fed selectively to storage conveyor or plant-feed conveyor.

NEW STORAGE FACILITIES at Enos plant provide capacity for 3,000 tons of raw coal. Now field delays no longer affect preparation.

Increased Daily Output

high-capacity coal haulers. The story in a capsule is that the new storage capacity prevents stripping delays from affecting the preparation plant and vice versa, and that the new haulers can now operate on two shifts per day, filling the storage silos on the second shift to enhance overall haulage efficiency.

On the latter point, W. J. Crawford, vice president—operations, and W. C. Laidlaw, chief engineer at Enos, point out that three of the new 63-cu-yd Autocar haulers replace six older 44-yd trucks. Using the same number of drivers, the new units haul more coal with greater fuel economy. Furthermore, the use of the new units on two shifts per day increases their value by forestalling obsolescence. The object is to consume the new units in useful service, thus permitting the company to take advantage of new haulage developments as they become available.

The storage facilities, designed by Templeton-Matthews Corp., Terre Haute, Ind., consist of two 1,500-ton bins made of Armco corrugated liner plate and associated loading conveyors and reclaiming equipment. The system complements the original 1,000-ton truck hopper which provided the only storage capacity. Each of the new bins is 40 ft in diameter and 51 ft high. They are based upon a concrete slab which also forms the roof of the reclaiming tunnel.

Raw-Coal Storage

Average daily loadings of clean coal at the Enos plant in 1957 were 6,200 tons. Since the new facilities were placed in operation the daily average has increased to 7,200 tons, and on Jan. 9, 1958, the plant produced 7,700 tons of clean coal, the all-time record for a single shift for an Indiana mine. The new storage bins, which receive much of the credit for this increase, are designed as follows:

The haulage trucks continue to discharge into the original hopper which feeds a 12-ft rotary breaker. One of the early problems to be

RECIPROCATING FEEDERS, with maximum 600-tph discharge rate, feed stored coal to reclaiming belt in tunnel.

THREE NEW 63-YD HAULERS replace six 44-yd units in hauling coal from pit to plant with increased economy.

GROSS WEIGHT with payload of new coal haulers is 171,660 lb. Diesel engine in tractor produces 335 bhp at 2,100 rpm.

COAL-HAULAGE FLEET also includes 10 53-yd tractor-trailer combinations which have been added since 1950 to keep up with new hauling developments.

solved in designing the system was to retain as much of this original set-up as possible, while providing for selective transfer of the raw coal either to the storage bins or the cleaning plant.

This problem was solved by redesigning the hopper under the rotary breaker to permit it to receive the discharge of the reclaiming belt. In addition, a reversible belt conveyor was installed under the collecting hopper of the rotary breaker, as shown in the diagram, to serve either the plant-feed conveyor or the storage conveyor. In either case, it is the 6x0 product of the rotary breaker that is fed into storage or into the plant. Capacity of the conveyor system is 1,000 tph and all belts are 48 in wide.

The arrangement at the top of the storage bins permits loading all the coal into either bin or half of the total tonnage into each bin. This is accomplished by a separate 48-in distributing belt conveyor and a motorized gate in the superstructure, as shown in the diagram.

Reclaiming From Storage

Reclaiming equipment includes two heavy-duty reciprocating plate feeders in the tunnel under the bins, delivering from 200 to 600 tph of the minus 6-in raw coal to the 48-in reclaiming belt conveyor. The 295-ft-long reclaiming belt discharges into the collecting hopper of the rotary breaker, as previously mentioned.

The reciprocating feeders in the tunnel are powered by variable-speed drives which may be remotely controlled from the main plant control center or from a separate control center in the rotary breaker building. In fact, all units in the storage system may be controlled from either center.

The usual scheme of operations is to start reclaiming coal from storage at the low rate about 2 hr after the beginning of the cleaning-plant shift. This is done to blend the sizes from the field and the storage bins. Reclaiming can be done at the high rate to offset field delays.

Dead storage of coal in the bins, which might lead to spontaneous ignition, is prevented by clay fill at the bottoms of the bins to direct all stored coal toward the feeder openings. Low and high bin-level indicators inform the operators of the quantity of material in the bins, warning them to start the storage conveyor at low level or stop storage at high level. A list of the suppliers of equipment for the storage facilities is shown in an accompanying panel.

As to further benefits which might accrue from raw-coal storage, it was pointed out by Mr. Laidlaw that fewer loading points in the pits might be required since loading has become a two-shift operation. Such concentration in loading would be reflected in more concentrated stripping and less complicated supply-and-service procedures.

Designers and Suppliers of Enos Storage Equipment

Engineering Design	Templeton-Matthews Corp.
Construction	Enos Coal Mining Co.
Conveyor belts	Hewitt-Robins, Inc.
Conveyor machinery	Hewitt-Robins, Inc.
Bin-level indicators	Hewitt-Robins, Inc.; Jeffrey Mfg. Co.
Motors	Allis-Chalmers Mfg. Co.
Controls	Allen-Bradley Co.
Speed reducers	Jones Machinery Div., Hewitt-Robins, Inc.
Structural steel	Modern Welding & Boiler Works
Storage bins	Armco Drainage & Metal Products, Inc.
Belt-conveyor covers	Barber-Greene Co.
V-belt drives	Browning Mfg. Co.
Automatic wing gates	Templeton-Matthews Corp.

Modern Coal Haulage

The new trucks are bottom-dump Autocar AP-25 tractor-trailer combinations powered by turbocharged Cummins NRTO engines. Brake horsepower is 335 at 2,100 rpm, which is the governed speed. Nominal capacity of the Autocar-Darby trailers is 61 cu yd, struck, and 69 cu yd, heaped.

Overall length of the combination is 53 ft 4 in, and width is 11 ft 8⅝ in. Turning radius of the tractor is 31 ft 6 in and maximum degree of turn is 104 deg. A full hydraulic power assist eases steering.

Helping to "HOLD THAT ROOF!"

O-B SHELLS AND PLUGS

"Hold That Roof!" is the title of a 27-minute, sound-color film produced by Ohio Brass to promote a better understanding of bolting principles and practices among underground production workers and bolting crews.

The film, which has already been shown to over 10,000 mining men, is available through local O-B representatives for scheduled showings at individual mine properties.

Why not ask your O-B representative for a "preview" showing to see how "Hold That Roof!" will fit into your bolting training program or safety campaign?

OHIO BRASS COMPANY, MANSFIELD, OHIO
Canadian Ohio Brass Co. Ltd., Niagara Falls, Ont.

Ohio Brass

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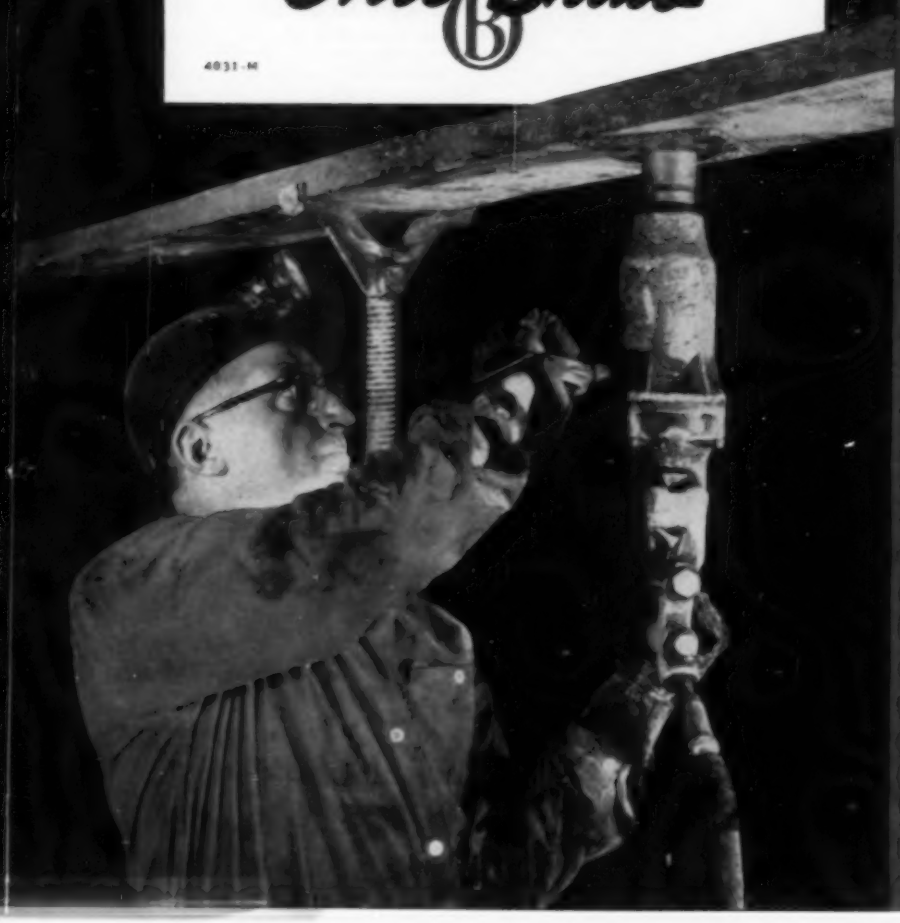


have your bolting crews seen it yet?

"hold that roof!"
"suggested installation procedures for safe roof bolting"

a 27-minute sound-color film produced by Ohio Brass Co.

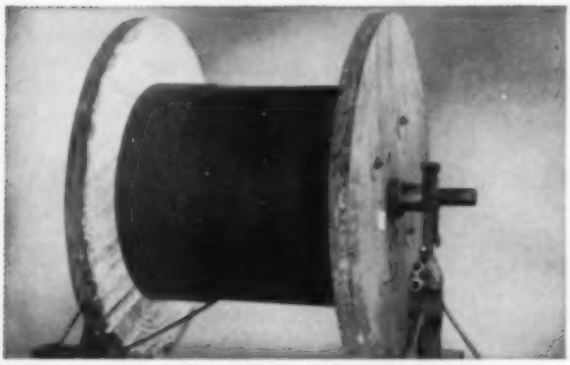
available through local O-B representatives for showings on your own property

already viewed by over 10,000 mining men!

see your O-B representative or write direct to Ohio Brass Co.

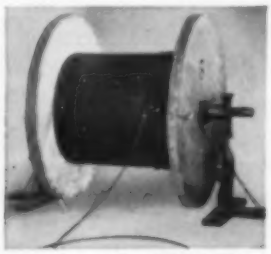
Tuffy® Wire Rope

How to Get Longer Service from Wire Rope: Proper Unwinding, Socketing, Seizing, Clipping



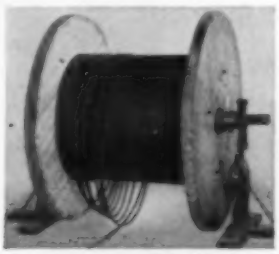
Here's the way to set up reel for unwinding

The stock reel should be set up on jacks, so the rope will come from the under side of the reel as shown in this picture.



Reel set up WRONG

The rope is coming from the top of the reel and forming loops as the reel over-runs. These loops are likely to form kinks and dog-legs, which can be ruinous to rope life.



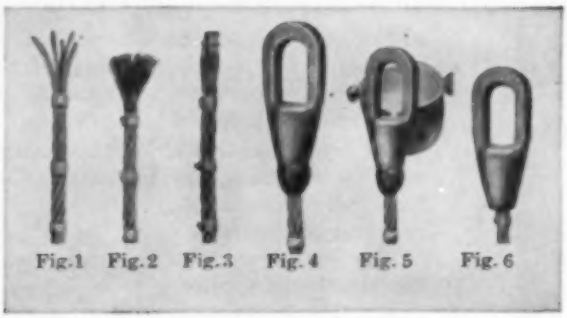
Reel set up RIGHT

Unwinding has started, and the reel is spinning faster than the rope is being pulled off. But because it's coming from the under side of the reel, the rope is simply loosening on the reel, with no damage.

Simple way for PROPER SEIZING

Since practically all wire ropes today are preformed, we suggest that when cutting you put only one seizing on each side of the cut.

For ropes other than preformed, *three* seizings should be used on each side of the cut so there will be no misplacement or relative movement of strands. *Four* seizings on each side are required for a lang lay rope, or any rope having an independent wire rope core or a wire strand core. *Four* seizings are also needed for all 18x7 ropes, and all ropes larger than 1" diameter.



Nine Steps of Correct SOCKETING

1. Securely seize and serve with soft wire ties before cutting, and have at least two additional seizings placed at a distance from the end equal to the length of the basket of the socket.

2. When the rope is properly seized, take off the end seizing. Cut the fiber center back to the seizing, as shown in Fig. 1 above. Untwist and broom out the wires. See Fig. 2.

3. Clean the wires for the distance they are to be inserted in the socket. Use benzine, naphtha, gasoline or other solvent. Then wash off in boiling water or boiling ammonium chloride used in Step 5.

4. Then dip cleaned wires in commercial muriatic acid to a depth not greater than ¾ of the cleaned length of wire. Keep the wires immersed for 3 minutes, or until the acid has thoroughly etched each wire. Be sure acid does not contact any other portion of rope.

5. Immerse wires into boiling ammonium chloride. A white coating will be left on the wires.

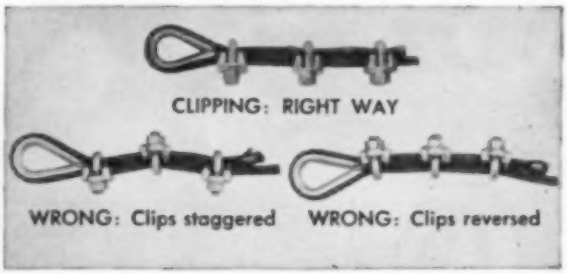
6. Place a temporary tie wire over the ends of the cleaned wire (see Fig. 3). Be careful not to get the cleaned wires greasy or oily.

7. Insert the rope end into bottom of socket. Remove temporary tie wire.

8. Holding the rope vertically in a vise, set the socket so that the wires are flush with top of the socket basket and seal the bottom with putty or clay (Fig. 4). Pour in among the wires about ½ teaspoon of sal ammoniac crystals.

9. Pour molten zinc into the basket to fill (Fig. 5). When zinc is solidified, remove seal. Socketing is complete as shown in Fig. 6.

58-3



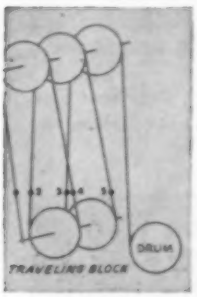
Tips

Be sure to use right FITTINGS

The fitting you use on wire rope can handicap it or enable it to work at full efficiency. Fittings which derive holding power from crimping action are harmful to the rope.

Shown here is a clamp that has no wrong side—can be put on either way. It snugly saddles the rope, grips larger surface area in such a way that loads are carried almost solely by friction rather than by crimping action. Combined in its two parts is a thimble and the parts are interlocking to prevent collapse of the thimble and to eliminate all shear on the bolts.

How to figure REEVING loads



Reeving ropes through the sheaves multiplies the number of parts supporting the load. The lead line to the drum carries the weight of the load lifted, divided by the number of parts of line supporting load, plus the accumulation of friction on all sheaves.

Here's how to count the number of parts supporting the load. Draw an imaginary line across the parts of the rope supporting the load.

The efficiency of reeving systems ranging from one to eight parts is shown in charts which Union Wire Rope engineers make available to users.

Your Tuffy distributor will help you with any wire rope problem

If you aren't acquainted with him, look under "Wire Rope" or "Slings" in the classified pages of your telephone directory. And ask him to put you on the mailing list for free "Rope Dope" educational bulletins. They're packed with boiled-down, useful information on the selection and care of wire rope for greatest service.

Extra Strength Alone Is Not Enough . . . Wire Rope Must Be BALANCED

Union Wire Rope Corporation has been making extra high strength rope for years for such uses as chokers in the logging industry, coke breakers in refineries and other purposes where it is a factor that overrides other rope characteristics.

But strength alone is not always the answer to the question of the proper rope to use. Extra high strength does not increase flexibility, resistance to crushing, abrasion or fatigue. It does not overcome the internal nicking and galling which occurs as the oil film breaks down from excessive pressures. It does not compensate for the core crushing which accompanies excessive loading. Extra high strength, in short, is not the only factor in proper design and use of wire rope.

Union Wire Rope combines such qualities as strength, flexibility and toughness in the properly balanced relationship to assure most efficient service and longest life in the operation for which the particular rope is designed. In most applications, extra high strength can add little to rope service if it throws other rope factors out of balance.

Tuffy BALANCED Special Purpose Wire Ropes

Tuffy BALANCED Slings & Hoist Lines

Top-performing team in every type of materials handling. Tuffy Slings are made of a patented, machine-braided fabric; stays extra flexible, can't be seriously hurt by knotting or kinking. Tuffy Hoist Line is a special construction of super flexibility and toughness.

Tuffy BALANCED Scraper Rope

It's flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Moves more yardage per foot because it's specially built and balanced to take the beating of drum-crushing abuse.

Tuffy BALANCED Dozer Rope

Built to give you longer service with less downtime. 150' reels of 1/2" or 9/16" mounted on your dozers allow you to cut off worn sections without wasting good rope. Put Tuffy Dozer Rope on the job and watch costs go down!

Tuffy BALANCED Dragline Rope

Made to give you maximum abrasive resistance with super flexibility. Rides smoothly on grooves; hugs the drum when casting for full load. Consistently dependable in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.

union Wire Rope corp.

SUBSIDIARY USS STEEL CORPORATION

2130 Manchester Ave. Kansas City 26, Mo.

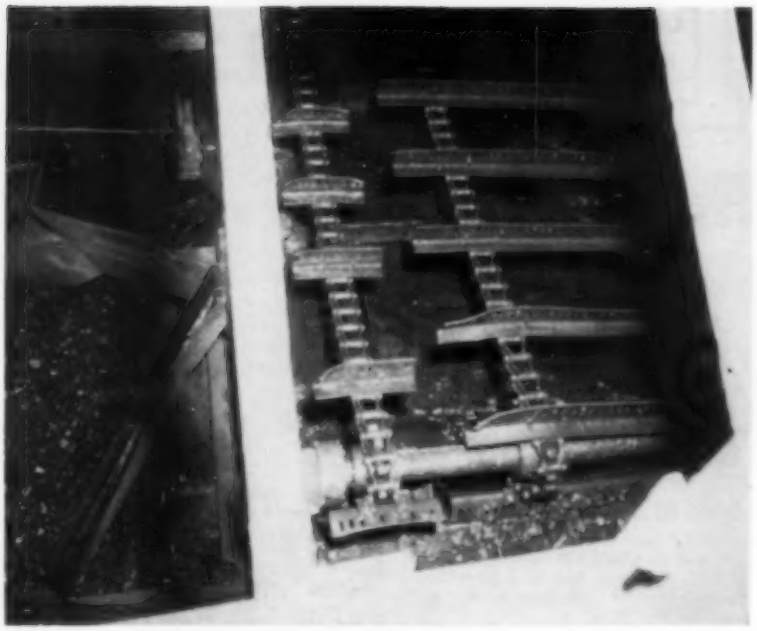
Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand.

Features of new system:

1 Clean coal, middlings, refuse from single vessel

2 Low power consumption for plant operation

3 Single drive on reclamation and sizing screens



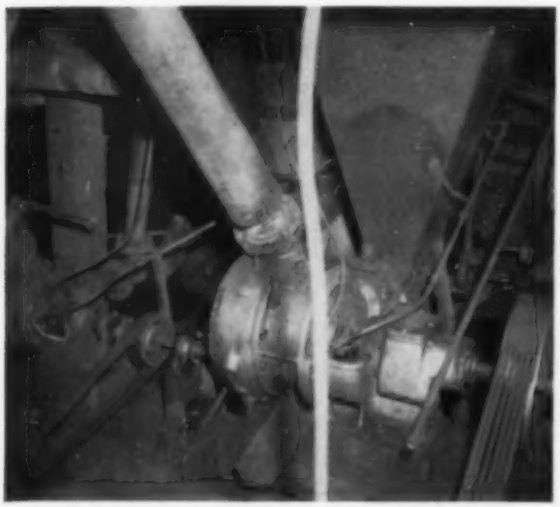
NEW HEAVY-MEDIUM SYSTEM at Reidinger Coal Service provides middlings product, if desired, from single vessel. Low power consumption and simplified medium-reclamation circuit are features of the new equipment.

Recently-developed units, now in anthracite plants, lead to . . .

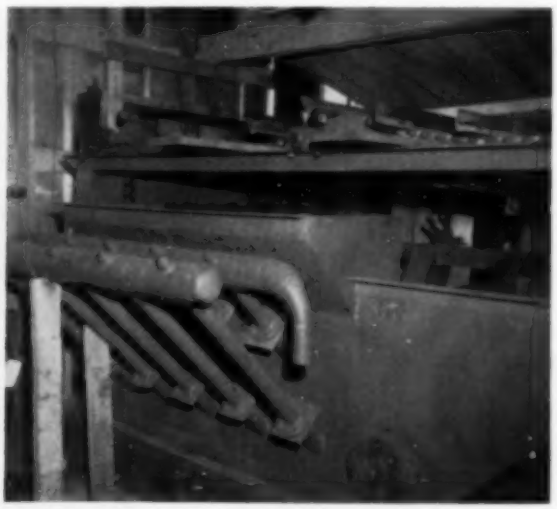
Low-Cost Heavy-Media Cleaning

A NEW ENTRY in the field of heavy-media systems is finding increasing application in the Pennsylvania anthracite region. The new vessel, a product of Menzies Engineering Co., Pottsville, Pa., is the patented brainchild of William C. Menzies who developed the Menzies cone which was used extensively in anthracite and bituminous installations. The new heavy-media system provides a middlings product which may be crushed and recirculated from the single vessel, and the unit may be operated with a single media pump.

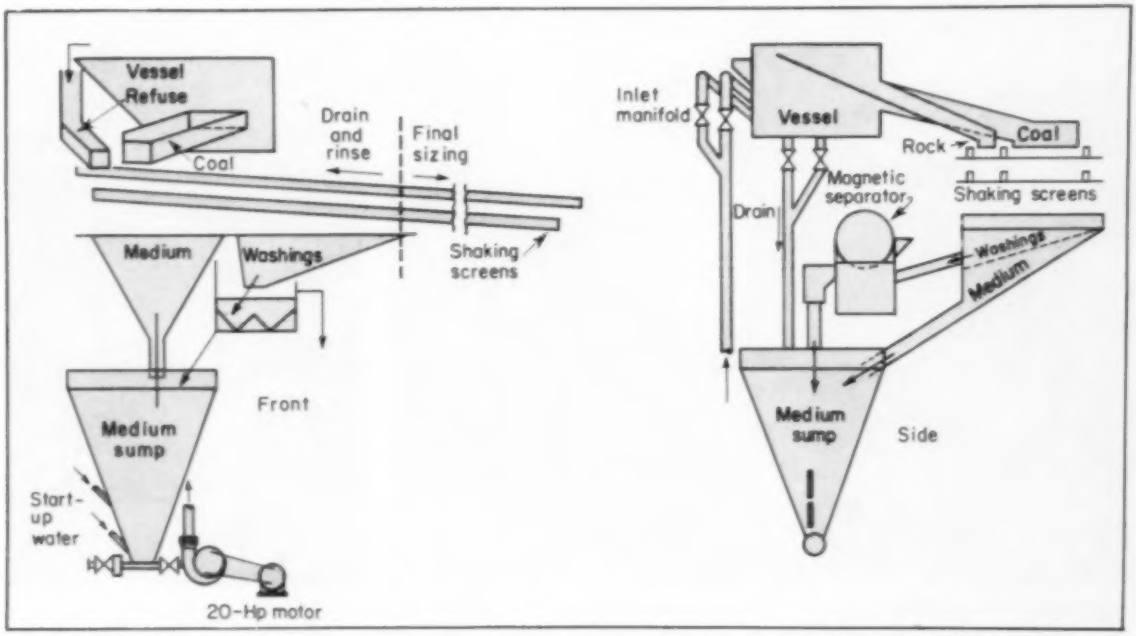
At one installation, Reidinger Coal Service, Paxinos, Pa., the system em-



TWO-PUMP SYSTEM at Reidinger plant includes a main pump (right) recirculating medium to vessel and secondary pump moving magnetic separator concentrate into main sump.



INSTALLATION AT D & Z COAL CO. shows manifold which admits medium into vessel. Feed chute is above manifold and clean-coal weir is at opposite side of vessel.



APEX COAL CO. plant layout requires only one pump in medium circuit and combines medium reclamation with final sizing. Therefore, a single drive motor powers all screening on the product side of the 60-tph cleaner.

ploys two pumps because the unit was installed in an existing structure in which it was impossible to locate the magnetic separator in the desired position for one-pump operation. In two other installations, as shown in the accompanying illustrations, the designers for Menzies Engineering, headed by A. Harold Leisawitz and Bernard Moser, were able to plan the structures and installations for one-pump operation. These plants are owned and operated by D & Z Coal Co., Weighscales, Pa., and Apex Coal Co., Ranshaw, Pa. The object is to locate the magnetic separator in such position that it receives by gravity the dilute medium from the drain-and-rinse screen and discharges the concentrated medium by gravity into the main medium sump. The water from which the magnetite has been reclaimed may then be recirculated as makeup water, dammed for decantation or sluiced from the magnetic separator to wet tables or other fine-coal cleaners.

As shown in the Apex layout, the drain-and-rinse screen is the leading section of the main sizing shakers. Thus all screening on the product side of the cleaning vessel is accomplished with a single drive.

RINSING SPRAYS operate over reclamation portion of final shakers. Clean-coal sizing takes place on the screen sections in the foreground at the Apex plants, and products are chuted into pockets

Vessel Design

One of the primary purposes of the Menzies system is to accomplish the three-step separation in which a middlings product is recovered in addition to the usual split between clean coal and refuse. This is achieved by introducing the medium through a specially-designed manifold at the side of the vessel opposite the clean-coal overflow weir. The resulting carefully-controlled cross-tank current stratifies the coal, boney and refuse at descending levels in the tank. The coal flows over, the bone settles to the bottom at the side of the tank opposite the inlet manifold nozzles and the refuse sinks along the inlet side of the tank. This provides a three-product separation in the single vessel.

A longitudinal divider in the bot-

CONSTRUCTION VIEWS, taken at Apex show relative size and ease of installation of vessel and medium sump. Clean-coal pockets at lower left in right photo receive products directly from final shaking screens.

tom of the tank separates the bone and refuse zones, and a single drag conveyor with separate flights for these two zones removes the bottom material from the tank. In such applications the drain-and-rinse screen is divided to keep the three streams of material apart. If a middlings product is not desired all sink material can be treated as refuse.

System Capacity

The units at Reidinger and Apex are 60 tph feed, although sustained runs at 80 tph have not overtaxed the systems nor impaired the efficiency of the separation. The D & Z installation is rated at 120 tph. The usual size range handled in one of the vessels is 3x3/16-in. material, which includes Egg, Stove, Nut, Pea, Buckwheat and Rice sizes, and the operating density of the bath is from 1.54 to 1.56 sp gr.

Presently on the Menzies drawing board is a 150-tph system, designed for single-pump operation and combined medium reclamation and sizing, which will require only 64 hp in drive units, as follows:

Unit	Drive, hp
Main pump	25
Magnetic separator	1.5
Bottom conveyor	7.5
Rinsing, sizing	30

The Reidinger installation, in which a clean-coal elevating conveyor and the final sizing screens are separate from the heavy-media system, requires drives as follows:

Unit	Drive, hp
Main pump	20
Washings pump	7.5
Bottom conveyor	5
Magnetic separator	1
Drain-rinse screen	10

The Apex unit, combining all operations through final sizing, includes drives as follows:

Unit	Drive, hp
Main pump	20
Bottom conveyor	5
Magnetic separator	1
Rinsing, sizing screen	20

Thus, the Apex packaged installation requires only 46 hp, exclusive of raw-coal handling equipment.

Start-up Procedure

A special piping system leading into the main medium sump of the Menzies unit eases the job of starting up the unit at the beginning of a shift. At the close of a shift the vessel is drained through 4-in pipes into the sump. During the idle period the magnetite settles into the bottom of the sump, creating a mass that is difficult to pump. Fresh water is introduced for a short time at start-up near the bottom of the sump and at the pump suction to fluidize this mass of magnetite to a consistency that can be handled by the pump. Within a matter of minutes the vessel is full and the magnetite suspension is mixed to its proper density. Draining of the vessel is controlled by 4-in gate valves and the start-up water by 1½-in plug valves. The feed to the inlet manifold is controlled by 4-in diaphragm valves.

The fresh water is shut off as soon as the pump moves the magnetite suspension freely.

Low-Cost Cleaning

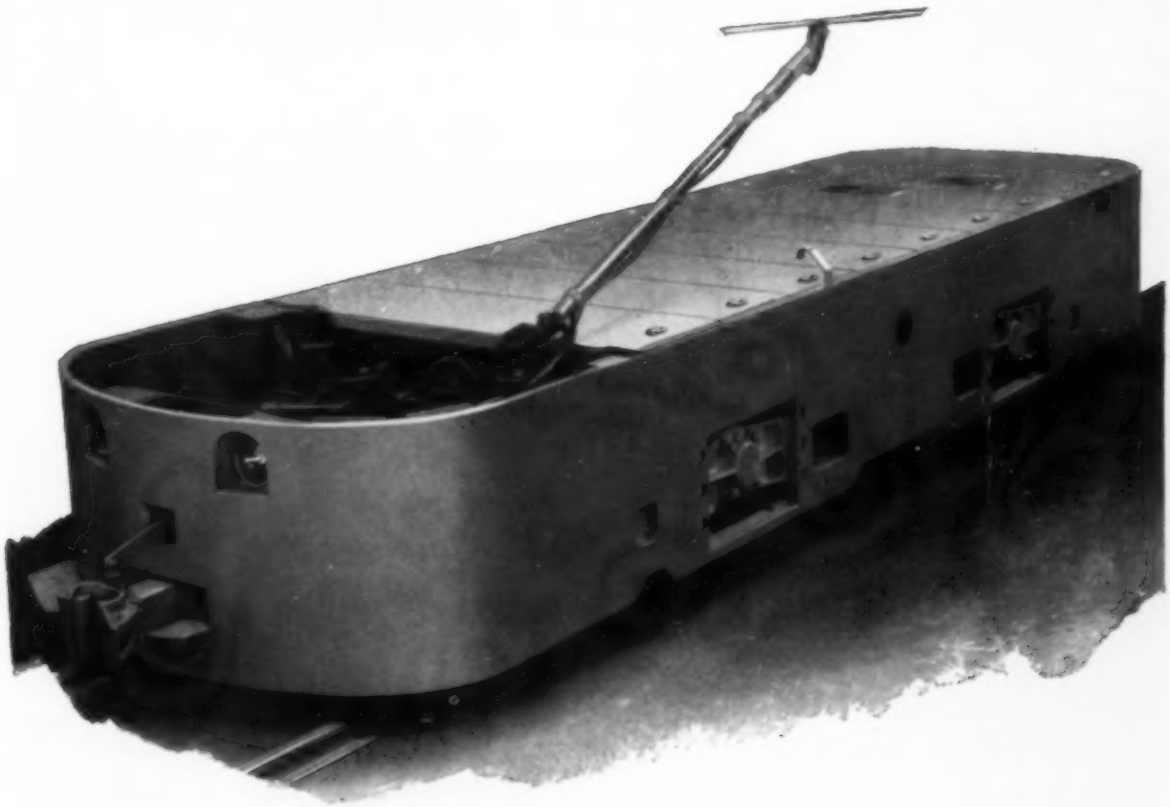
Low initial cost and low operating costs are claimed for the new system by virtue of its packaged availability and low power consumption. Magnetite consumption at the Reidinger plant, the first one in operation, figures out to about ¼ lb per ton of clean coal.

Most of the anthracite installations are cleaning coal mined by independent producers or handling bank material. The goal at all plants must be the preparation of Standard Anthracite or its equivalent in quality, and a brisk truck trade was noted at the Reidinger, Apex and D & Z plants.

You need this hard worker...

JEFFREY

27-Ton, 4-Wheel Locomotive



This work horse gives you plenty of power to pull heavy pay loads with 380 total horsepower available.

Jeffrey 27-ton, 4-wheel locomotives are driven by two motors having sufficient power to slip the wheels. This assures maximum "haul ability" with a rated drawbar pull of 13,500 lbs. at a speed of 10.8 mph.

Outstanding operating and safety features may include: roller-bearing type journal boxes and motor axle suspensions—air and dynamic service brakes—automatic couplers with air-operated uncoupler—trolley with air-operated retriever—separate blower for each motor—32 volt battery-operated control and headlights.

You can depend upon this mine locomotive for day in and day out operation with a minimum of maintenance.

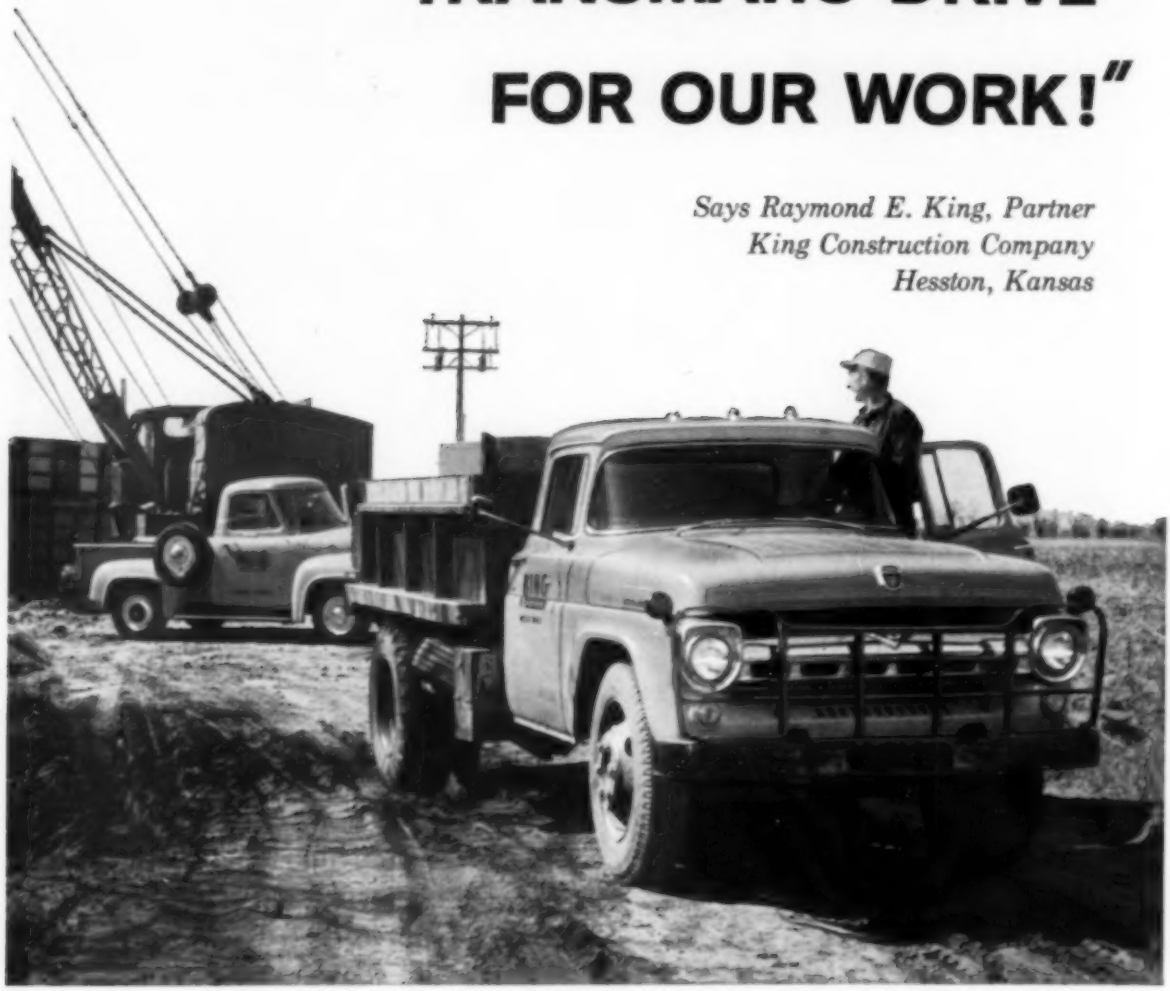
Catalog 836 describes all types of Jeffrey mine locomotives. The Jeffrey Manufacturing Company, 912 North Fourth Street, Columbus 16, Ohio.

JEFFREY

CONVEYING·PROCESSING·MINING EQUIPMENT...TRANSMISSION MACHINERY...CONTRACT MANUFACTURING

"YOU CAN'T BEAT FORD'S TRANSMATIC DRIVE FOR OUR WORK!"

Says Raymond E. King, Partner
King Construction Company
Hesston, Kansas



"For off-the-road work and hauling out of sand and gravel pits our Ford two-tonner with fully automatic transmission sure handles the loads

"We've put 42,000 miles on our F-600 dump in the last 9 months and are very satisfied with it. Gas mileage is good and tire wear is reduced. Another big advantage of Transmatic Drive is that you don't tear up axles coming out of sand pits. Also, its torque converter multiplies engine torque to get loads started and prevents harmful engine lugging. To do our job with a truck not equipped with Transmatic Drive would mean buying a truck at least one size larger."

Official 1957 registrations show . . .

AMERICAN BUSINESS BUYS MORE FORD TRUCKS THAN ANY OTHER MAKE!

Bring extra savings to your business . . . make your next truck a FORD!

Official registrations for 1957 show that *American business buys more Ford trucks than any other make.* There are many reasons for this popularity . . . many reasons for *you* to make your next truck a Ford!

To begin with, Ford offers a complete line of over 360 truck models, ranging from pick-ups to giant tandems. And there are Ford Dealers almost everywhere, ready to help you select the truck best suited for your individual job. They're ready with modern service facilities, trained mechanics and low-priced Ford parts to keep your trucks on the job, earning for you.

Ford trucks are your best buy! Ford's initial costs are *low* and resale value is traditionally high. The modern Ford Styleside pickups are the lowest-priced models available with full cab-wide body . . . giving you 23% more loadspace than any traditional pickup box.

Value-packed Ford Tilt Cab trucks offer exceptional payloads, maneuverability, service accessibility and driving ease. They're America's most popular tilt-cab line *by over two to one!*

Only Ford offers the economy of Short Stroke power in all engines, Six or V-8. And Ford's Heavy Duty V-8's offer new, advanced durability features. The modern Ford Six, available in Light and Medium Duty F- and P-Series trucks, is equipped with an economy carburetor that gives you up to 10% greater gas mileage. It's plenty peppy, too, with more horsepower per cubic inch than any other six in its class.

Ford's rugged cab and chassis construction means these new '58s are built to last. Every Ford has safety glass in every window. All this plus proof that Ford trucks last longer adds up to America's No. 1 truck value.

See your local Ford Dealer for the latest in '58 trucks or the best in A-1 used trucks.

King Construction Company's Ford F-600 with 178-hp Heavy Duty V-8 engine is an all-around performer. Transmatic Drive enables driver to easily back truck into position.

Carrying 5 to 6 yards of sand or rock, this Ford dump truck hauls many loads daily from nearby production sites.

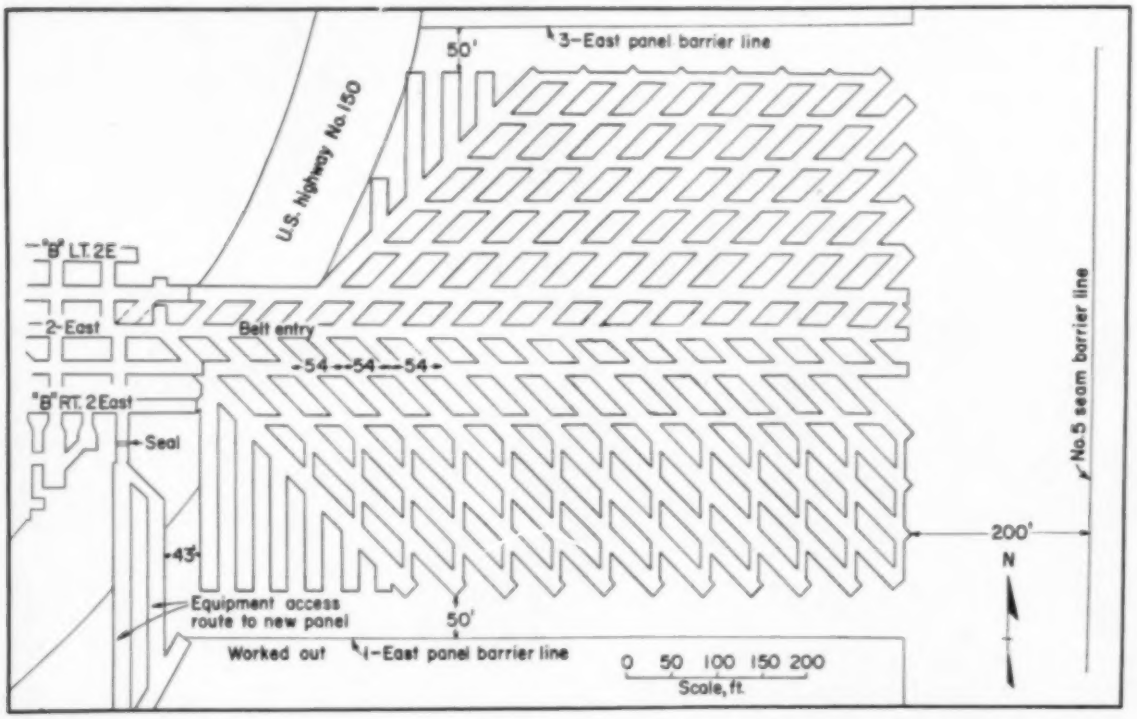
FORD TRUCKS COST LESS

LESS TO OWN . . . LESS TO RUN . . . LAST LONGER, TOO!

BORING TYPE MINING MACHINE, working in difficult conditions, boasts an average production of more than 300 tons per shift. The machine recovers 43 in of 50-in seam, leaving top and bottom coal to improve roof conditions.

Productive Continuous Mining

Top and bottom coal are left in place at Viking mine to compensate for bad conditions. Special crawlers on continuous-mining machine contribute to immediate increase in efficiency.



MINING MACHINES tram from worked-out panel to new area through coal, thus producing while moving. Worked-out panels are sealed. All turns are at 45 deg to provide full utilization of mining head on machine.

BORING HEADS use cutting-machine bits, making it possible to serve continuous and conventional units from single stock.

CONTROLLED CAVING in pillared areas marks Viking's continuous-mining methods. Pillars are taken open-ended.

Under Difficult Conditions

BAD SEAM CONDITIONS, complicated by previous mining of two lower seams, is no bar to productive continuous mining with a Colmol at Viking Coal Corp., Terre Haute, Ind. The AC-powered Model 76-AM low-type machine is recovering 43 in of the 50-in Indiana No. 5 seam, leaving a total of 7 in of top and bottom coal to stabilize the bottom and to prevent sloughing of the roof.

The best shift tonnage produced so far is 400 tons with a crew of seven face workers, as follows: Colmol operator and a helper; two shuttle-car operators; a pickup loader operator; a utility man and a loading-head attendant. This output includes pillar coal.

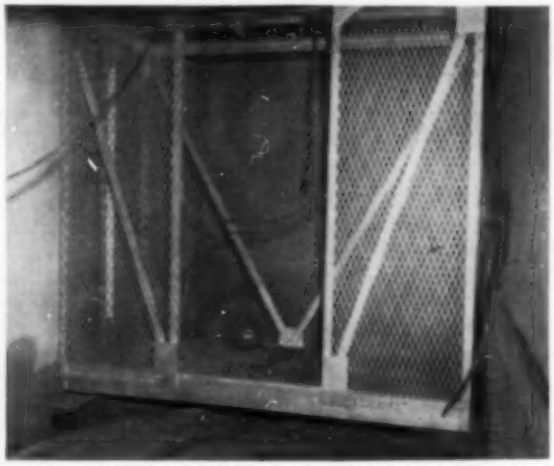
This level of performance is achieved in spite of the fact that sulphur streaks occur in the coal, a rock band is fairly persistent near the bottom and hard boulders project into the seam from both roof and bottom.

Special measures, in addition to leaving the few inches of coal, have been taken to compensate for the soft bottom. The original crawlers on the Colmol were 10 in wide. Keeping the machine from breaking through the coal into the fireclay became a major problem. The solution in this instance was to lay timbers ahead of the crawlers as the machine advanced to provide a better bearing surface. Later the crawler pads were increased in width to 12¾ in, resulting in an immediate gain of about

PICKUP LOADER loads shuttle cars which discharge onto panel belt. Main haulage is on tracks, using 5-ton mine cars.

FINAL STAGES of panel recovery finds shuttle cars discharging into mine cars. Belt has been moved to next panel.

AC-POWERED continuous-mining machine is served by this 2,300/440-V transformer (left) and 1,200-gal tank (right) containing treated water for sprays. Trailing cable and water hose are taped together and carried to machine as a unit.



NEW AIRSHAFT and escapeway serves active area of expanding workings. Headframe was erected for handling rock during sinking operations and supporting cage (right) in completed shaft. Main sheave was moved back after shaft sinking.

20% in actual operating time. The crew still uses sections of 8-in steel channels under the crawlers. However, the company plans to purchase new crawlers which are to be 14% in wide. This will further reduce the ground pressure exerted by the machine.

As shown in the accompanying diagram of a panel now being recovered by the Colmol, rooms are turned at 45 deg on 54-ft centers from the entries. Rooms are 18 ft wide and entries are 14 ft wide. The panel-recovery plan is designed to permit turning breakthroughs on 60-ft centers at 45 deg from the rooms. Similarly, slabbing cuts are taken from the inby ends of the pillars by turning into these cuts at 45 deg from the rooms.

Panel development in this instance consists of driving three entries to the panel limit and working the rooms and robbing the pillars to the right of the entries on advance. Rooms to the left of the entries are worked and the pillars robbed as the panel is retreated. The entry pillars also are taken. The rooms to the right are on the return side of the ventilation circuit and those to the left on the intake side. Thus, production faces get the air first throughout the life of the panel. Worked-out panels are sealed.

Normal procedure in the rooms is to make an initial 30-ft advance with the Colmol, which has a mining width of 9 ft 8 in, then to return to the starting point and make a parallel advance of 60 ft. The room is completed by alternating the 60-ft advances with 30-ft retreats. Extra rooms may be driven, as shown, to square up the panel for maximum recovery, but in all instances the turns are at 45 deg to keep the full width of the boring head in coal as much of the time as possible.

Roof support in rooms consists of a double row of posts along the left side of the room, leaving the right side clear since the practice is to take slabbing cuts off the right-side pillar during final recovery. Pillars are taken open-ended, and each of the completed cuts is posted before a new cut is started. These posts protect the operator as he makes the new cut.

The slabbing cuts are taken completely across the end of the pillar

to break out in the next room to the right. All coal is taken unless unusually bad roof conditions interfere with safe recovery. In such instances, one cut is left to stabilize the situation and a new breakthrough is driven to start the robbing sequence again. Good roof breaks have been achieved so far, the fall usually following removal of the coal by a day or two. None of the posts are recovered. They do not delay the falls because they are pushed through the bottom coal into the soft bottom as weight develops. The fireclay underlying the seam ranges from 12 to 20 in. thick.

Room transportation is provided by Joy 6-SC shuttle cars which discharge onto a 36-in belt conveyor in the center entry. The belt discharges into 5-ton bottom-dump mine cars which are dumped underground into a 200-ton hopper to feed the slope belt. Descriptions of these operations at Viking appear in *Coal Age*, in the June and September, 1955, issues.

Power for the Colmol is provided at 440 V by a Westinghouse dry-type transformer. This underground unit is mounted on a skid base for easier moving. Incoming power to the transformer is introduced through a borehole cable at 2,300 V. The transformer is installed in a crosscut at one side of the belt entry near the belt head.

On the opposite side of the entry a shopmade, 1,200-gal water tank is installed to supply dust-allaying water to the Colmol. The belt-head attendant has both the transformer and tank under his observation. The tank is filled with mine water on one of the offshifts and approximately 1 lb of neutralizer is added at each filling. The neutralizer is Formula 1290, furnished by Industrial Chemicals, Inc., at a cost of 30c per lb. A cartridge of Johnson-March Compound M is also added. These additives keep the sprays clean, prevent sludge deposits in the tank, pump and piping, and contribute to thorough wetting of the dust.

The Colmol is the only continuous unit now in operation at Viking, working one shift per day, as mentioned. Three conventional units operate on the first shift and two of these on the second shift. Each of the conventional units also includes a roof-bolting machine operated by two men.

The practice of leaving the roof coal, combined with the fast recovery, makes it possible to eliminate roof bolting from the continuous-mining section. The posts provide sufficient support.

Average production per shift is 320 tons from the Colmol unit. The unit crew is headed by a face foreman, and the unit is charged with part of the time of a mine mechanic.

The Colmol, in moving from the previously-recovered panel to the presently active one, advanced through coal to tap into the new panel entry as shown in the diagram. This eliminated a long move of all equipment out through the mains, and the machine produced coal while moving.

Recently a new airshaft was sunk to serve the area in which the Colmol operates. The shaft, which was planned and supervised by Colvin B. Burk, general superintendent, is 260 ft deep, concrete-lined throughout. A 42-in Jeffrey fan, driven by a 50-hp motor exhausts 50,000 cfm. Provision has been made at the surface to install a twin fan.

An innovation in the construction of the shaft was the use of a headframe which served during the sinking of the shaft and which remains in place to handle the man cage. The main sheave in the headframe was centered over the entire cross-section of the shaft while the broken rock was hoisted out and the lining was poured. After this work was completed, the sheave was set back in the frame and centered over the escapeway half of the shaft.

Management of the Viking Coal Corp. includes W. S. Webster, president, and Birch Brooks, vice president, at the Terre Haute headquarters of the company. Mr. Burk heads the operations at the mine. Stewart Johnson is mine superintendent, and Jesse Shepperd is mine manager. The maintenance department is headed by Ray M. Biggs, electrical engineer, assisted by Henry Thomas, chief electrician on the first shift, and Morris Adams, chief electrician on the second shift.

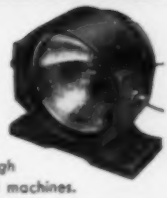
Correction

It has been called to our attention that in the article entitled "AC for Deep Mining," *Coal Age*, May, 1958, an error occurs in the statements beginning at the bottom of p 84. The article states that reactance can be reduced by spacing lines far apart. The opposite is true. Lines should be close together to minimize reactance.

EXPECT the BEST *from all* FLOOD CITY PRODUCTS

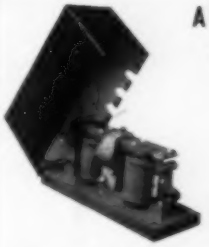
HEADLIGHTS

6, 32 and 115 V.



Sealed beam throws powerful light which does not dim with use. Sturdy, long life enclosure suited for rough use on mine locos and machines.

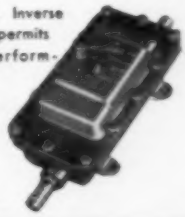
AUTOMATIC TRANSFER SWITCH



Simple, compact.. designed to perform efficiently under hard use. Completely automatic, the proper circuit is always connected to the power source, whether cable or trolley. Cover is dirt and drip-proof.

"NO-FUSE" TYPE PERMISSIBLE STARTER

For gaseous mines. Inverse time limit element permits maximum motor performance with positive protection. In event of overload it is only necessary to move handle to "reset" position, no fuse to change.



FUSED ALL-PURPOSE SWITCH

70 to 400 amp

For any D. C. Safety Switch application at less initial cost. Compact, sturdy, and thoroughly sealed against moisture. Also made as two circuit-junction box.

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BRASS & ELECTRIC CO.

JOHNSTOWN, PA.

SALES AGENT:

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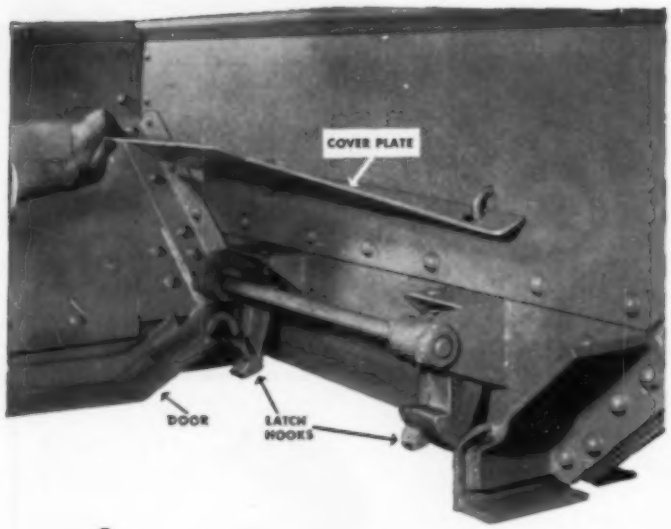


Only S-D Automatics give you these advantages

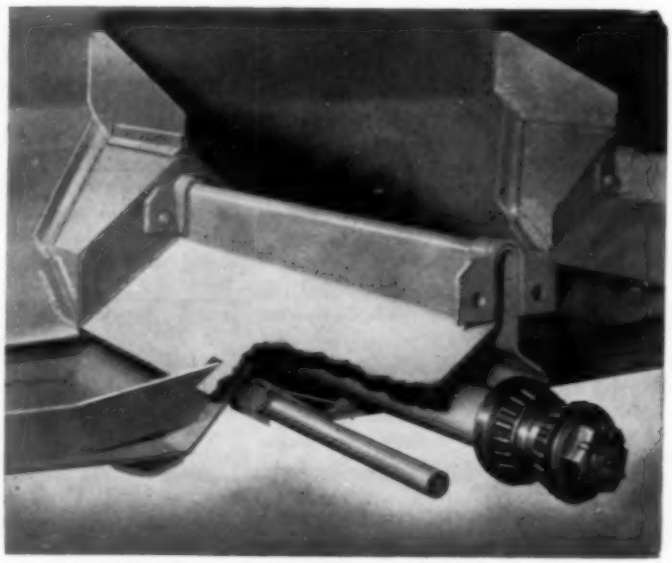
1 TWO LATCHES FOR SAFE AND SURE LATCHING! They are tripped simultaneously underneath car for automatic dumping. With S-D "Twin Safety Latches" your bottom dumping car doors are actually padlocked twice. These latches (see photo above) are tripped independently by a pair of tripping devices mounted between the rails. (Note the tripping devices shown in bin photo on opposite page.) Both latches must be tripped simultaneously before the doors open. This eliminates doors opening accidentally anywhere along the haulage route.

1 "Twin Safety Latches" for safe and sure latching

2 Safety Sealed against dust leakage

3 ¼ to ½ ton more capacity per car for the same overall dimensions

2 SEALED AGAINST DUST LEAKAGE! Sanford-Day's exclusive bottom dumping car seal means two extra values: (1) Sealed S-D Automatics give you a new, safer in-the-mine operation by eliminating leakage of dust. (2) Sealed S-D Automatics enable you to make a tremendous reduction in track clean-up costs. Cross-sectional view at right points out how the flares extend over doors when closed, sealing material in car.



3 ONE-QUARTER TO ½ TON MORE CAPACITY PER CAR FOR THE SAME OVERALL DIMENSIONS is available only in S-D Automatics because of the construction features of Sanford-Day's exclusive bottom dumping car design. If you were buying, for example, 16 bottom dumping cars of any other make with a 4-ton level full capacity, you would need only 14 S-D Automatics of the same overall dimensions to haul the same tonnage. You would save two cars in every 16 . . . 12½ percent in original investment . . . 12½ percent in maintenance . . . 12½ percent less dead weight to haul. Any one of our sales engineers will demonstrate to your complete satisfaction just how we are able to give you this extra capacity.

THESE THREE fundamental and necessary advantages are offered only by S-D Automatics! They mean that only S-D Automatics can haul coal out of your mine at the lowest possible cost! Assure yourself of the maximum economies bottom dumping cars offer you by buying S-D Automatics! For complete information, write or call us today. Sanford-Day Iron Works, Inc., P. O. Box 1511 . . . Telephone 3-4191, Knoxville, Tenn.

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MINE CARS, All Types - PRECISION WHEELS - "Brownie" HOISTS CAR RETARDERS - SPOTTERS PUMPS - OIL SPRAY SYSTEMS

AND BROWN-FAYRO DIVISION

MORE CAPACITY and easy operation are combined in an improved overburden drill at the Robbins Coal Co. Design enables unit to work near edge of highwall.

Better Drill Cuts Cost At 40 to 1 Strip Mine

Improved vertical overburden drill serving two pits slashes drilling cost by one-third in thick, tough rock. Unit is key to successful recovery of 24- to 36-in coal under as much as 100 ft of cover at Alabama mine.

ABILITY TO DO in 16 hr per day and one less day per week what formerly required around-the-clock operation 7 days a week is a major benefit of adding an improved model overburden drill at the Robbins Coal Co., Oneonta, Ala. This new unit is Robbins' answer to the problem of cutting drilling cost in thick, hard overburden while mining 24- to 36-in coal.

Several years ago Robbins Coal Co. was faced with a drilling bottleneck because its reserves under thinner cover were becoming exhausted. As the overburden became thicker and thicker, the company's drilling and blasting costs mounted. To prevent drilling costs from getting out of hand, the company developed a high-capacity, low-cost, rotary dry-type overburden drill that could be mounted on an old tractor at a minimum cost (*Coal Age*, October, 1956, p 84).

Other strip operators were impressed with the performance of the Robbins drill and asked the company to make similar units for them. The upshot was that the Robbins shop in Oneonta, Ala., became a small factory turning out overburden drills tailored to the customer's need. As a result of the success with these early drills, a separate corporation, the Robbins Machine & Mfg. Co., Inc., was set up to manufacture and market the drill. Robbins Machine then took over the mining company's shop in Oneonta and converted it into a compete drill factory. The remodeled shop has its own design and engineering section, as well as machine shop and assembly section.

As soon as the engineering and designing headquarters were completed, engineers set out to design standard unit assemblies which could be used in various combinations according to customers' needs. Each of the early drills had been virtually custom made. As a result of Robbins Machines' extensive development and engineering program, new features were incorporated in the drill. This latest model, the RR10, now is in service at Robbins Coal and is responsible for the company's greatly improved drilling record.

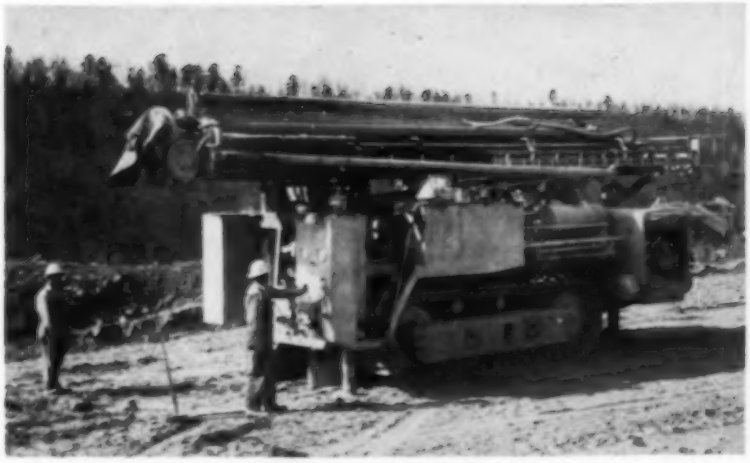
New Design Features

Among the improvements incorporated in the RR10 drill are:

1. A hydraulically-powered swivel pipe rack that speeds adding or removing a section of drill pipe.
2. A hydraulically-controlled device for breaking sections of drill stem loose rapidly.
3. A heavier angle drive and transmission. Instead of the original rack-and-pinion method of feeding the bit, the drill now has a chain-drive and sprocket arrangement.
4. Unit-assembly-type design that makes possible easy and fast disassembly for on-highway hauling where weight is a problem. For example, major unit assemblies which can be easily removed are the mast, front jack, air compressor and Rotoclone.
5. A redesigned and improved control panel.
6. Improved hydraulic leveling jacks.

Where The Drill Works

One of the new RR10 units handles all of the overburden drilling in the two Robbins pits near Taits Gap, Ala. In Pit A the overburden is moved by an extra charge of explosives on the front row of blast holes. Two Cater-



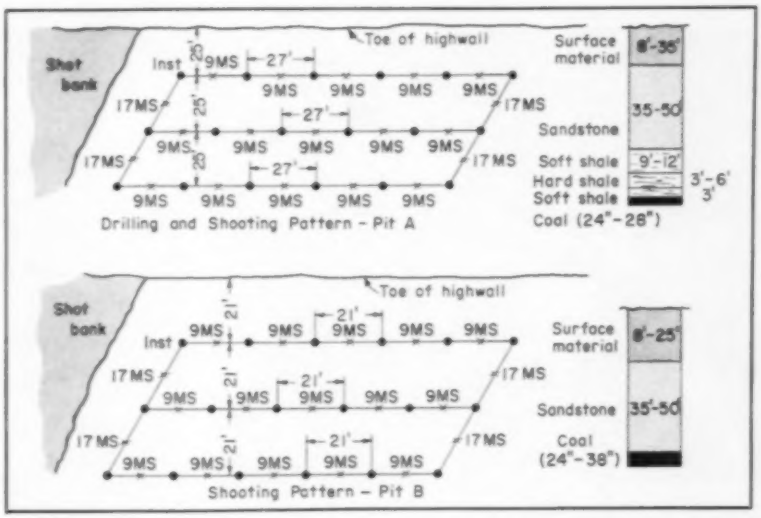
MOVING from one pit to another is simplified with mast in lowered position. Mounted on large tractor, the unit can travel to new pit in a minimum of time.

TOUGH overburden includes as much as 55 ft of sandstone plus shale layers.

pillar D-9 tractors working two shifts per day pushing into the open pit, followed by a Bucyrus-Erie 17-cu yd electric shovel, assisted by a 7-cu yd Page dragline working in the spoil banks, remove up to 100 feet of cover in three-shift operation 7 days per week. In Pit B a Marion 7-cu yd dragline works two shifts 6 days a week. Overburden in both pits is made up of hard shales and sandstone. The cover averages 70 ft and frequently runs up to 100 ft.

In Pit A blast holes are spaced on 27-ft centers in rows 25 ft apart with holes in alternate rows staggered. Overburden, beginning at the top of the coal, includes 12 to 18 ft of shale, 35 to 50 ft of hard sandstone and 8 to 35 ft of surface material.

The shale includes several layers of varying hardness which make it easier for the drillers to check on the nearness of the drill bit to the coal. For example, immediately over the coal there is 3 ft of soft shale that is always covered by 3 to 6 ft of hard shale. This variation in hardness of the shale is consistent and thus serves as a guide for the drill operator. Drillers are instructed to stop the machine as soon as the bit cuts through the hard layer and hits the soft material.



DRILLING AND SHOOTING procedures are designed to get maximum fragmentation at lowest cost. Millisecond delays improve shooting results.

Making Explosives

If blastholes are dry, a mixture of loose ammonium nitrate and fuel oil is poured into the holes as a blasting agent. If there is only a small inflow of water the ammonium nitrate and oil mixture is packaged in polyethylene bags at the drill hole and then dropped into the opening. But if considerable water flows into the holes the company uses du Pont Hi Cap in water-resistant cartridges in the lower part of the hole and the ammonium nitrate and fuel oil in the upper section.

If water is present, most of it enters at a small rider seam of coal located immediately under the sandstone. Under this condition 50 to 150 lb of Hi Cap is placed in the bottom of the hole and stemming is added to a point 2 ft above the base of the sandstone. Then the ammonium nitrate and fuel oil mixture with a du Pont EL497 primer is added and the hole is stemmed to the top.

Holes in the outer row of blastholes in Pit A are charged in the ratio of 1 lb of explosive to 1¾ cu yd of rock. Those in the second and third rows are charged with 1 lb of explosive per 2¼ cu yd of overburden. The EL497 primer is packaged in 10-lb polyethylene bags and makes up 5% of each charge. This particular primer was chosen because it is insensitive and cannot be detonated by the stripping shovel or drill if there should be a misfire.

Fuel oil is added to the 50-lb bags of Spencer prilled ammonium nitrate right at the drill holes. Approximately 2 qt of No. 2 diesel oil is poured into each bag and left to soak through the ammonium nitrate until all holes are ready to be loaded. After all the

DRY HOLES receive oil-treated ammonium nitrate prills directly from bags.

DAMP HOLES are loaded with nitrate-oil mixture packed in polyethylene bags.

WET HOLES are loaded with explosive packaged in water-resistant cartridge.

BREAKING DRILL PIPE is simplified with a hydraulically powered device. Pipe is uncoupled by rotary drive.

OPERATOR CONTROLS and levers are conveniently located on panel for ease and comfort of machine operator.

material has been treated with oil, the drill helper and explosive man charge the holes. If a hole is dry, one bag of treated Spencer prills is poured into the bottom of the hole. Then a primer of du Pont EL497 is added. Next, treated prills are poured in to bring the explosive-to-overburden ratio to the proper value. Finally, drill cuttings are added to fill the hole.

All blast holes are laced with Austin detonating fuse, and du Pont 9- and 17-MS delays are used between holes. The company prefers not to detonate more than 50 holes at a time, and holes never are left standing over 48 hr. The short 9-MS delays are used because of cracks and crevices in the rock which might open up if a longer delay were used.

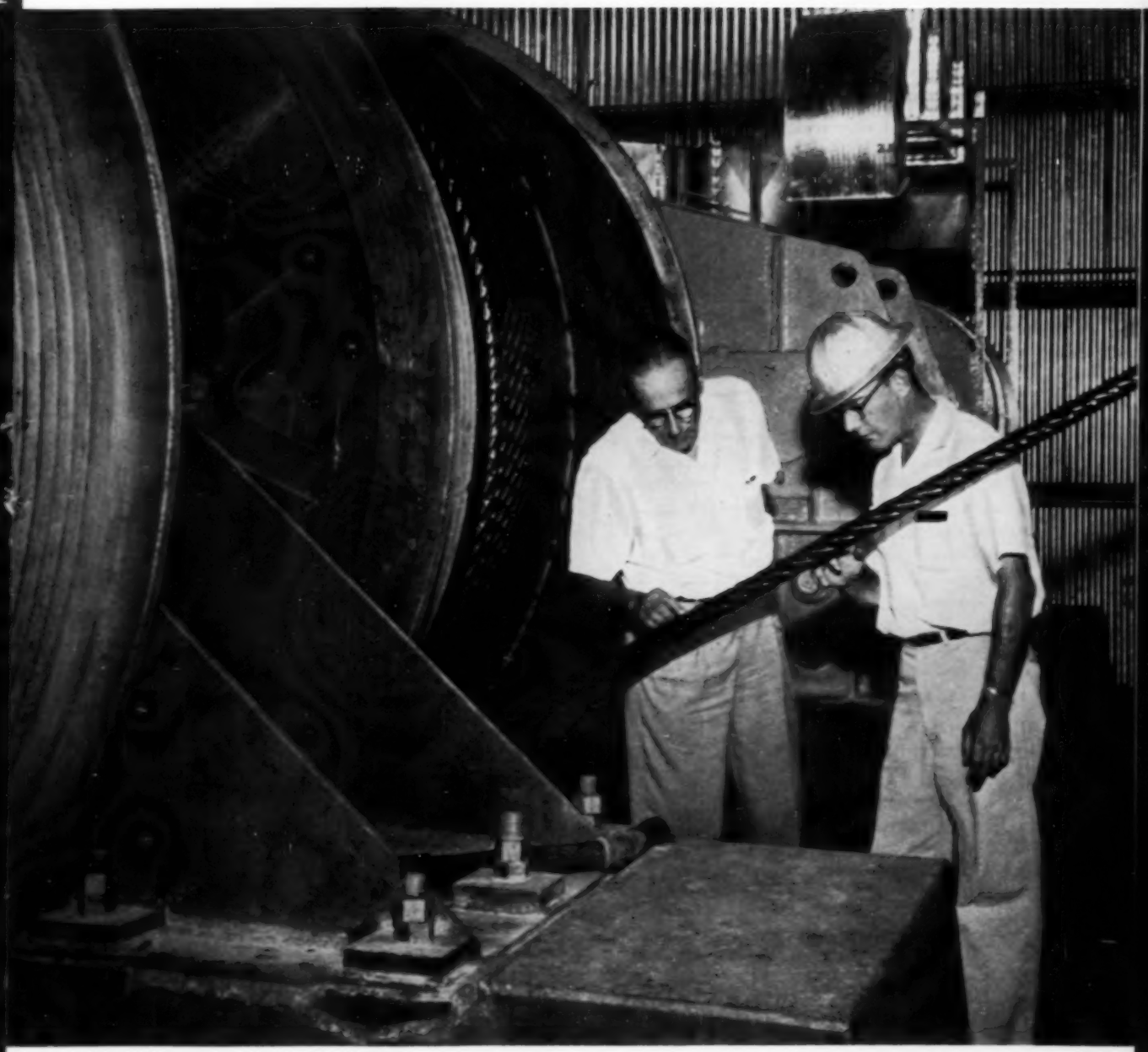
In Pit B, blastholes are drilled 21 ft apart in three rows spaced at 21-ft intervals. Holes in alternate rows are staggered. Explosives are used in all three rows in the ratio of 1 lb per 1½ cu yd of overburden.

Overburden in Pit B consists of 35 to 55 ft of sandstone immediately over the coal, then 8 to 25 ft of surface material. Holes are drilled to the top of the coal and then are backfilled 3 to 5 ft before explosives are placed in the hole. The company follows the same procedure in charging holes as in Pit A.

The RR10 drill stays in one pit until the reserve of broken material in the other pit is reduced to the minimum established by the company. It takes only 10 to 15 min to lay the drill mast down and get the unit ready for tramming to the other pit. The only work involved is the removal of four bolts, after which the mast is lowered with the two hydraulic cylinders mounted on the drill frame.

When drilling the hard sandstone the RR10 unit cuts through rock at the rate of 2 fpm. The drill pierces shale at speeds up to 12 fpm. The company says that the bit penetration rate in shale is limited at times only by the ability of the compressed air to flush out cuttings.

In an average 8-hr shift, a two-man crew drills 400 to 900 ft of 9-in hole at the Robbins Coal Co.'s pits, depending on the percentage of sandstone in the overburden. Hughes OWVJ drill bits are used.



Healthy after the first million tons. This is the hoist house at Pima Mine, near Tucson, Arizona—first southwestern mine to use skip hoists for open-pit operations. Because of the steep pitch of the ore body (45 degrees), the Pima management decided that skips would be more economical than conventional open-pit methods.

Two skip cars working in balance haul copper sulfide ores and waste to the top of the pit. Each of the cars weighs 15 tons and is capable of handling 22 tons of ore, dirt, and rock. Pitch of the skipway is a steep 38 degrees. Both drums of the hoist are rigged with Bethlehem wire rope, 1⅞-in. Purple Strand, 6 x 25 W. The photograph above shows one of these ropes under inspection, after the system had lifted its first million tons. The rope and its twin were both found in excellent condition, ready to start work on the second million.

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GAS WELL PILLAR STUDY

JOINT COAL & GAS COMMITTEE

Gas Company Information:

Company _____ Well No. _____

Tract _____ Twp. _____ County _____

Coal Seam _____ Amount of Cover _____

Approximate date of failure _____ Approximate depth of failure ___

Remarks _____

Name of Person preparing report _____

Coal Company Information:

Company _____ Mine Name _____

Coal Seam Name _____ Coal Seam Thickness (inches) _____

Elevations - Bottom of coal _____ Surface at well _____

Size of gas well pillar - diameter or sides of square (feet) _____

Type of mining around pillar (check one) Partial extraction _____

Full extraction _____ % Recovery around pillar _____

Type and condition of bottom - Wet ___ or Dry ___ Hard ___ Soft ____

Type of rock _____

Type of roof rock _____

Approximate date of first mining around well pillar _____

Approximate date of final retreat around well pillar _____

Direction of dip of coal seam and % of dip: % Dip ___ Direction ___

Remarks _____

Name of Person preparing report _____

Designs for Gas-Well Pillars

Oil-and-gas industry, coal industry and state officials in Pennsylvania cooperate in advising successful legislation on how to design protective pillars to support gas wells which pierce coal seams.

By **George J. Donaldson Jr.**, Mining Engineer, The Peoples Natural Gas Co., Pittsburgh, Pa.
And **James G. Tilton**, Mining Engineer, Equitable Gas Co., Pittsburgh

DATA SHEET on gas wells was jointly prepared by gas and coal companies.

THE PENNSYLVANIA Gas Operations, Well Drilling, Petroleum and Coal Mining Act, No. 225, was passed by the Pennsylvania legislature in 1955, and was approved Nov. 30, 1955, by Gov. Leader. This Act regulates the drilling, operating, and plugging of wells and the underground storage of gas under workable coal seams. The Act also created a division of the Department of Mines, known as the Oil and Gas Division, which is supervised by a Deputy Secretary of Mines for Oil and Gas. Joseph T. Kennedy, Secretary of Mines and Mineral Industries, with the approval of Gov. Leader, appointed W. Roy Cunningham to head this division.

What the Law Says

Section 203 of the Act provides that a pillar of coal shall be left around any oil or gas well, and states in part, "The division shall not require the coal operator to leave a pillar in excess of 100 ft in radius, except that if it is established that unusual conditions exist requiring the leaving of a larger pillar, the division may require a pillar up to, but not exceeding, 150 ft in radius." "Pillar," as defined in this Act, "means a solid block of coal surrounded by either active mine workings or a mined out area." At first glance this provision seems adequate, but a closer look disclosed to the gas and mining engineers that only a maximum size pillar had been set forth, and that no real working size of pillar was available. Consequently, the deputy secretary of the newly formed Oil and Gas Division was swamped with requests for pillar permits and conferences concerning pillar sizes. These conferences were necessary because the coal companies, the gas companies, and the Division could not agree as to what size pillar should be left.

The deputy secretary proposed as a guide the following plan as a minimum standard coal pillar until an agreement could be reached between the coal and gas industries:

Depth, Ft	Radius of Pillar, Ft
0–500	50
500–700	75
700–Up	100

These standards were put into effect immediately.

Engineering Conferences

On May 24, 1956, the deputy secretary called a conference of the representatives of the Western Pennsylvania Coal Operators' Association to discuss the problem of well pillar size and to obtain their opinion as to what would constitute a safe pillar for the protection of a well. The coal operators offered the following proposal:

1. On any active well:

Cover, Ft	Radius of Pillar, Ft
0–500	50
Over 500	75

Abstract of presentation at annual meeting of Central Appalachian Section, AIME, and West Virginia Coal Mining Institute, at White Sulphur Springs, W. Va., Nov. 8, 1957.

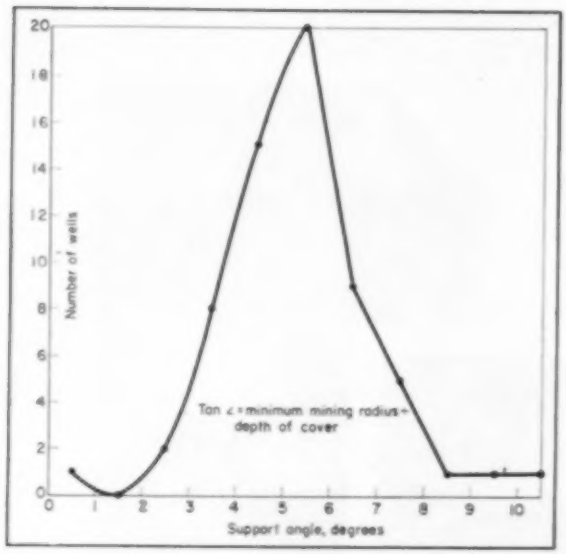

FIG. 1—FREQUENCY DISTRIBUTION of numbers of wells vs. support angles.

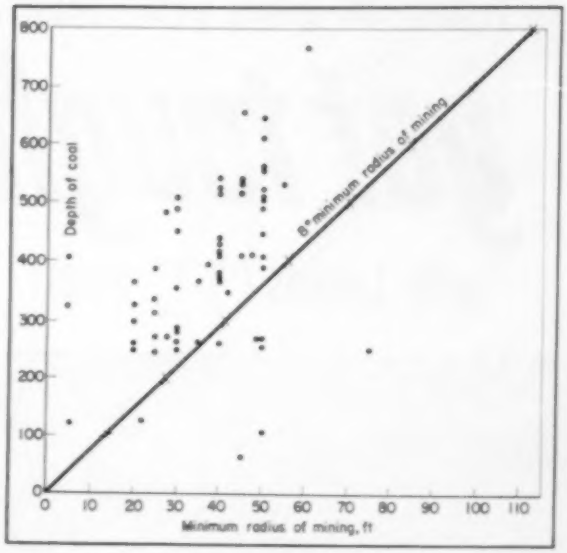

FIG. 2—WELL DEPTHS vs. minimum radii of mining in relation to 8-deg support angle.

2. With an adequately plugged well, a flat 50-ft radius pillar would be left for any depth of cover.

3. An inadequately plugged well, by their standards, would be treated as an active well.

The following week, on May 31, 1956, the deputy secretary called a conference of the representatives of the Pennsylvania Natural Gas Men's Association to discuss well-pillar size and to obtain their opinion as to what would constitute a safe coal pillar to protect a well. The representatives of the gas industry could not at this time make any definite statement as to what size coal pillar should be left to protect a well.

Engineering Analysis

J. G. Tilton, Equitable Gas Co., had made a partial study of some 30 wells that had been sheared or pinched off because of pillar failure. No attempt was made to determine the size of pillar left to support each well. A list of these wells was submitted to the deputy secretary; and the representatives of the gas industry suggested that a study be made in order to approach the problem of safe pillar size from an engineering and analytical standpoint.

The deputy secretary requested that the Western Pennsylvania Coal Operators' Association and the Pennsylvania Natural Gas Men's Association appoint a committee to study the problem. The group was known as the Joint Coal and Gas Committee, and the following agreed to serve: Chairman, H. C. Rose, president, Pittsburgh Coal Co.; W. G. Stevenson, general manager, J. H. Hillman and Sons Co.; William Foster, general attorney, United States Steel Corp.; J. V. Goodman, vice president, Equitable Gas Co.; C. P. Duncan, chief geologist, Manufacturers Light and Heat Co.; and George J. Donaldson Jr., mining engineer, The Peoples Natural Gas Co.

A meeting of the Joint Committee was called on June 25, 1956, to discuss the method to be followed and the data to be assembled in making a comprehensive study of coal pillars. The accompanying form was prepared to be sent to the oil and gas companies for completion.

After the oil and gas companies had completed their portion of the form, it was then forwarded to the coal companies for completion. In addition to the completed form, the coal companies were requested to submit a map showing the topographic location, and a mine map —scale, 1 in=100 ft—for each damaged well throughout their coal holdings. The form and the maps were to be returned to the Joint Coal and Gas Committee.

At this same meeting on June 25, 1956, a subcommittee was formed to make a detailed study of the material to be supplied by the various coal and gas companies. This subcommittee was composed of Mr. Donaldson; A. R. Werft, chief engineer, Frick Div., United States Steel Corp.; J. G. Tilton, mining engineer, Equitable Gas Co.; and J. S. Whittaker, general superintendent, Pittsburgh Coal Co.

Information on 77 wells was turned over to the subcommittee. To facilitate their study, the sub-committee grouped the wells according to county and township, and the data was then tabulated. After a detailed examination of all the data accumulated for each well, the subcommittee decided that the following items were pertinent and would receive preference during the study.

1. General location map (Scale: 62,500 topo sheets).
2. Calculate angle of support (depth vs minimum radius).
3. Plot depth vs minimum radius.
4. Calculate area of pillars.
5. Plot area vs depth.
6. Plot terrain as to four categories: (a) level; (b) gentle slope; (c) steep slope; (d) top of hill.

It was found that the 77 wells involved in this study were located in five counties; namely, Allegheny, Fayette, Greene, Washington, and Westmoreland. The locations of the wells were spotted on topographic maps to determine if the damaged wells were confined to one definite area. It is the opinion of the committee that the damaged

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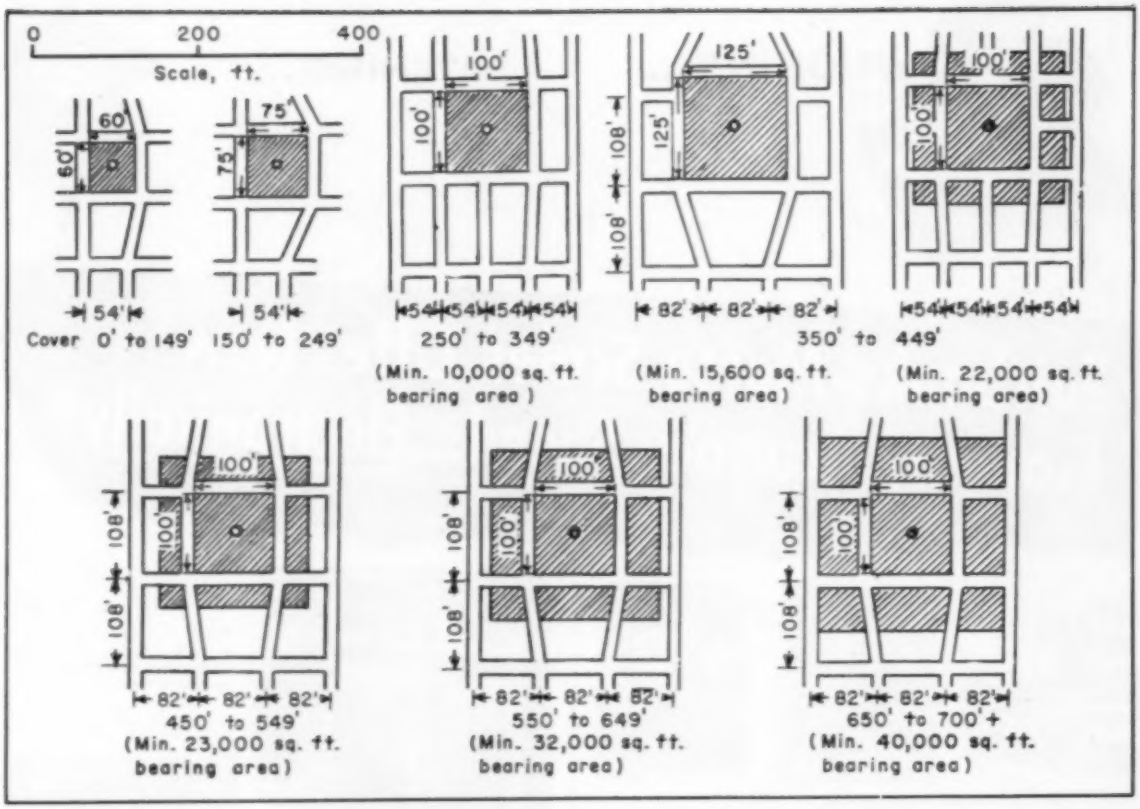

FIG. 3—PILLAR PLANS for various depths of cover.

wells are generally distributed throughout the region.

During the examination of the well data, it became apparent that the point of damage to the well casings was located in the coal horizon. The original thought was that the well casings were being damaged above the coal horizon by the action of draw during and after the mining operations. The discovery that the damage was located in the coal horizon reversed this trend of thought and proved that failure of pillars was the cause of the damage. This led to the calculation of the angle of the depth of cover against the minimum mining radius, called the angle of support. The minimum mining radius is the shortest distance from the well to a mined-out area. The calculated angles were tabulated statistically, and a frequency distribution curve was constructed (Fig. 1). This curve shows that the greatest frequency of pillar failures is found when the angle of support falls between 5 and 6 deg. At 8 deg the curve dropped to one well and continued in a straight-line relationship for isolated wells.

Engineering Calculations

As a result of this study, it was decided to construct a graph plotting the depth of cover of each well against its minimum mining radius (Fig. 2). The 8-deg angle was plotted on this graph to observe the number of wells which fell below and above the deciding line.

A study of the wells that fell above the 8-deg line indicated that there were causes other than just pillar failure. Some of these causes were:

1. The well not being centrally located in the pillar;
2. Inadequate stumps left around small pillars;
3. A hillside shift.

Up to this point in the study, all work had been based on the minimum mining radius and depth of cover. In order to confirm the tentative conclusions previously reached, it was decided to determine the relation of the bearing surface in square feet of the pillar with the depth of cover. The pillar area is the actual amount of coal left to support the well as scaled from mine maps.

Various shapes of pillars were encountered, and it was evident in many instances that sufficient total area of pillar or pillars was left to prevent failure, had the pillars been concentric with the well, and had the corners of the pillars not been removed.

A graph was then constructed by plotting the depth of cover of each well against the area of its pillar (Fig. 4). The 8-deg area curve was then superimposed upon the graph. The graph showed that the majority of the damaged wells fell below the 8-deg area curve. Those wells that fell above the 8-deg area curve were examined individually, and it was found that the causes were similar for those wells which fell above the 8 deg minimum radius curve (Fig. 2).

A summary of the terrain at each well was compiled, but the committee feels that terrain was not a contributing factor to well pillar failure. The information concerning the character of the roof and bottom strata of the coal seam was not used by the committee in arriving at their recommendations, since there is no way to cor-

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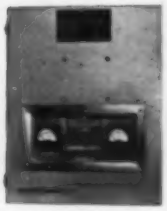

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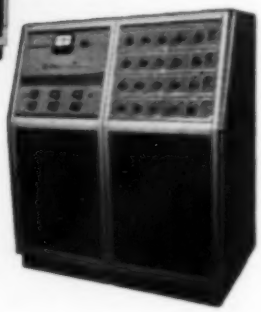

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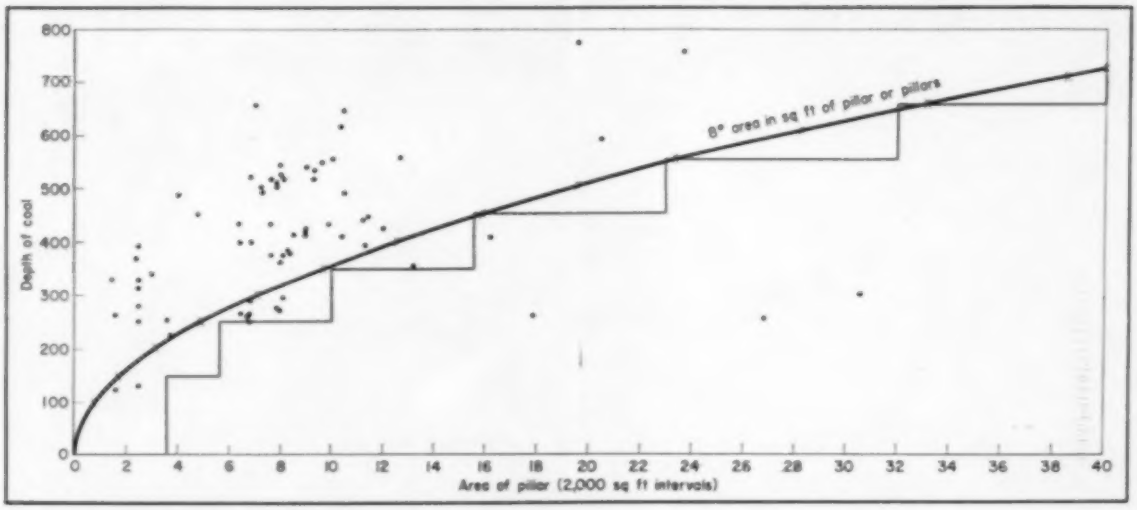

FIG. 4—WELL DEPTHS vs. areas of pillars in relation to 8-deg support-angle conditions.

relate this data to actual failures. It is also felt that the direction and the percent of dip of the coal seam have no bearing on pillar failure.

Committee Recommendations

Following a detailed examination of the data, the sub-committee on Jan. 22, 1957, made the following recommendations to the Joint Coal and Gas Committee:

1. The pillar or pillars comprising the required pillar plan should be in the form of a square.

2. The well should be centrally located within the required pillar plan.

3. The required pillar plan should conform to the following specifications, wherein the greatest depth of cover shall be used in each range to determine the total bearing area as applied to the 8-deg area curve.

Cover, Ft	Req'd Solid Pillar Area, Sq Ft	Req'd Additional Pillar Area (Solid or Split) Sq Ft	Total Area Bearing Surface Required Sq Ft
0– 99	1,600	.....	1,600
100–149	3,600	.....	3,600
150–249	5,625	.....	5,625
250–349	10,000	.....	10,000
350–449	10,000	5,600	15,600
450–549	10,000	13,000	23,000
550–649	10,000	22,000	32,000
Over 650	10,000	30,000	40,000

Note 1. 40,000 sq ft is the maximum bearing area required except under unusual conditions.

Note 2. As to the additional pillar area required, the following specifications must be adhered to:

The excavated area shall not exceed 15 ft in width.

The shortest pillar dimension shall not be less than twice the width of the excavated area.

It was felt that the split pillar would facilitate mining operations—haulage, ventilation, drainage and so on without destroying the value of the pillar plan.

On Jan. 31, 1957, the joint committee met to consider the report and the recommendations of the sub-committee. The report was approved, with minor changes, and one recommendation was added pertaining to wells abandoned under Act No. 225. Both the sub-committee and the joint committee recommended, with respect to wells which have been abandoned and plugged under Act No. 225, that special consideration be given by the Oil and Gas Division to approve pillars smaller than those required for active wells.

On Feb. 4, 1957, the report was presented to a meeting of the Western Pennsylvania Coal Operators' Association and representatives of captive mines. The report was generally approved by those present.

On Feb. 5, 1957, the report was presented to a meeting of the representatives of the natural gas companies in the area and was approved.

On Feb. 15, 1957, the recommendations of the Joint Coal and Gas Committee and the sub-committee were presented to Mr. Cunningham, of the Oil and Gas Division. The deputy secretary submitted it to a commission of state mine inspectors comprised of C. H. Curry, chairman; George S. McCaa, and the late J. V. McKenna. The commission approved the report and recommendations with one minor exception, which was that the minimum size pillar should be not less than 3,600 sq ft. Fig. 3 is an example of pillar plans for various depths of cover. The pillars left for depths of 349 ft or less are all solid pillars and cannot be split. Cover of 350 ft or more may be a solid or split pillar. The pillar, whether solid or split, must adhere to the minimum bearing area.

On Apr. 29, 1957, the Department of Mines and Mineral Industries of the Commonwealth of Pennsylvania adopted the recommendations as amended to be used as a minimum standard for pillars for the protection of oil and gas wells in Pennsylvania. Fig. 4 is the required area that is being used by the Oil and Gas Division for the size of pillar to be left in the Pittsburgh and thick Freeport seams of coal. These standards have been accepted by the coal and gas companies in the area. Then superimposed on this graph is the required area of pillars accepted by the Oil and Gas Division. This graph shows that many of the wells that fell above the 8-deg area curve are now below the required area graph.

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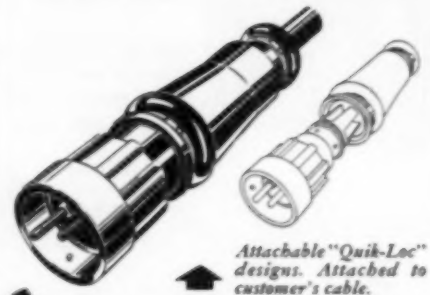

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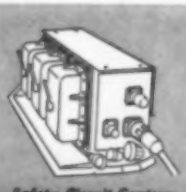

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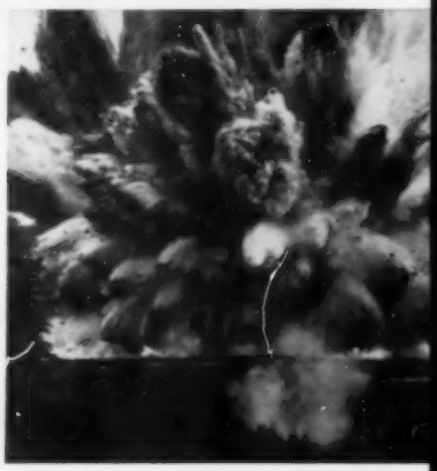

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NCA OFFICERS: Retiring president L. Newton Thomas (seated left), president, Carbon Fuel Co.; president F. F. Kolbe, president, United Electric Coal Cos.; Tom Pickett, executive vice president; (standing left) vice president, Harry Laviers, president, South-East Coal Co.; treasurer George E. Enos, president, Enos Coal Mining Co., vice president H. Vernon Fritchman, vice president, Rochester & Pittsburgh Coal Co.; Thomas Howarth, secretary-asst. treasurer. Not pictured: vice presidents Mark E. Eastin Jr., president, West Kentucky Coal Co.; and K. A. Spencer, president, Pittsburg & Midway Coal Mining Co.

Mobilizing for Progress

NCA Chicago meeting calls for more aggressive attack on legislative and marketing problems. Exporters, despite current drop, plan for lasting, high-level overseas shipments.

RENEWED CONFIDENCE in a bright future for coal—based on expanded industry-wide effort to attack legislative and marketing problems—dominated sessions of the 41st Anniversary Convention of the National Coal Association and the 13th Anniversary Convention of the Coal Exporters Association of the United States, Inc., held jointly in the Conrad Hilton Hotel, Chicago, Ill., June 4-5.

Notable in convention proceedings were talks by L. Newton Thomas, retiring president, NCA; Hon. Thruston B. Morton, U. S. Senator, Kentucky; Dr. Robert E. Wilson, retired chairman of the board, Standard Oil Co. of Indiana; and Jean Picard, president, Association Technique de l'Importation Charbonniere, Paris, France.

Dr. Dexter M. Keezer, vice president, McGraw-Hill Publishing Co., headed up a panel of experts which discussed "The Economic Outlook for the Coal Industry." Bituminous Coal Institute gave evidence that its sales engineering program was "cooking with steam." The convention adopted a resolution asking for mandatory controls on residual oil imports. Frank F. Kolbe, president, United Electric Coal Cos., was elected NCA president.

Highlights of the papers and reports presented follow:

Planning for the Future

L. Newton Thomas, president, National Coal Association.

Increased productivity and improved mining procedures have enabled coal producers, in the face of rising equipment costs and repeated wage increases, to keep the price of the product substantially the same as it was 10 yr ago. Profits, however, are much less than 10 yr ago. And, if coal is to stay competitive with other fuels, the benefits of mechanization cannot all be passed along in the form of wages. Some must be retained for the investors who made this mechanization possible, and some must be kept to buy more machinery and continue the trend.

Also, in planning for the future, the coal industry must be ready to meet the changes of the challenging future with flexible, aggressive policies. In particular, coal producers must work together to develop uniform policies to attack legislative and marketing problems. The speed and effectiveness of this work will be in direct proportion to the number and quality of men assigned to the job.

I am confident that the coal industry could meet the demands of the future, and that the Nation's energy supply could be guaranteed if government and the public fully appreciated how essential coal is to the national economy.

INDUSTRY MEETING—
A Special COAL AGE
Staff-Written Report

Legislative Problems

Hon. Thruston B. Morton, U. S. Senator, Kentucky.

The dumping of natural gas at less than cost for use under industrial boilers is inexcusable. Public and Congressional opinion must be mobilized to develop marketing practices consistent with the principles of conservation.

Restricting excessive imports of residual oil, checking government expenditures for development of high-cost atomic reactors that will compete with coal, and expansion of coal research should also be kept high on the industry agenda.

If the coal industry will exert the same resourcefulness and forceful imagination in selling as has been true in mining coal, the future should certainly be a bright one.

Tom Pickett, executive vice president, National Coal Association.

Legislation enacted by Congress, and its administration by government agencies, influences almost every step in production, distribution and consumption of coal. The industry must, therefore, be more diligent than ever in keeping its problems properly before the Federal Government.

NCA will continue to do its best unremittingly in attacking legislative problems. But I urge the industry to broaden its influence by enlarging the scope of its activities. Results will be more lasting and effective if NCA's efforts are supplemented by those engaged in the business.

Impact of the Atom

Dr. Robert E. Wilson, retired chairman of the board, Standard Oil Co. of Indiana.

Any private investment in commercial atomic power generation in the near future will have to be inspired more by long range hopes and public service motives than by reasonable expectation

of substantial early profit. More specifically:

1. There will be few, if any, unsubscribed atomic power plants built in this country for purely commercial purposes within 10 yr. These "few, if any" would be only at points remote from conventional fuel supplies and with high load factors.

2. Between 10 and 25 yr from now (the time depending partly on technological developments and partly on relative price trends of competitive fuels), a moderate but increasing proportion of the larger commercial power plants may well be built without subsidy to utilize atomic fuels. However, no existing plants of reasonable efficiency would be shut down or converted to atomic fuel, and the principal effect on the public utility industry will be higher capital requirements, hopefully offset by somewhat lower fuel costs.

During the next 25 yr, the decrease in the percentage of power production obtained from natural gas, oil and water power will be greater than the percentage which atomic energy is likely to take up. So, coal will probably be taking care of a slightly increasing percentage of a rapidly increasing demand.

While atomic energy will doubtless supply some new markets, especially abroad, which coal might otherwise have cared for, I foresee for at least two decades a substantial and continuing recovery in the demand for coal, after its long slump.

Economic Outlook for Coal

Dr. Dexter M. Keezer, vice president, McGraw-Hill Publishing Co.

Coal's future depends on what happens to the general course of business and to coal-consuming industries.

The slump in business should "bottom out" between July 4 and Labor Day and here's why: For the past 9 mo, inventories have filled the gap between high-level consumption and the substantial drop in industrial production. Now, however, we have reached the zone where we must cease living off inventories which are being used up at a $6 billion annual rate.

Exactly when the upturn will occur depends largely on what the government may do to further promote recovery. But business should move up moderately by the end of the year, in response to increased spending in defense, local, soft goods and housing categories. The outlines of another boom are shaping up. And coal should gain a large share if expectat' coal-consuming industries bear ou. predicted below.

C. F. Clausen, manager, Manufacturing Process Department, Portland Cement Association.

Exporters See Stable, High-Level Market

NO NEW AND VALID REASONS have appeared to question a lasting European shortage of coal, although needs will show ups and downs. Jean Picard thus keynoted the 13th Anniversary Convention of the Coal Exporters Association of the United States in a luncheon address, June 5. Mr. Picard is president of A.T.T.I.C. (Association Technique de l'Importation Charbonniere, Paris, France).

"The best proof I can give you of my conviction is the decision we took to set up a company for building nine vessels. The size of these vessels shows the confidence we have in the future of American exports to France."

Mr. Pickard endorsed an estimate of the High Authority which put imports of Community Countries at 47 million tons in 1965 and 42 million tons in 1975. In buying this coal, the U. S. will be an important source although "there are traditional suppliers who cannot be bypassed."

The European coal executive encouraged long-term contracts as the best means of aiding U. S. producers to stabilize an adequate, long-term supply of coals.

Low freight rates are an unhealthy situation, Mr. Picard pointed out. European producers find "they are no longer faced with normal competitive conditions and there find a ground for opposing continuing imports of American coal."

Competition "must be based on freight rates which would ensure normal profits for the shipowners. Such competition would even protect the European consumers against any eventual tendency on the part of the producers to quote excessive prices."

Association Business

In a business session following the luncheon, the Board of Directors re-elected all officers. They are:

President—John S. Routh, chairman of the board, Routh Coal Export Corp.

Vice President—W. H. Naylor, Pocahontas Fuel Co., Inc.

Treasurer and General Counsel—James W. Haley, vice president, Jewell Ridge Coal Corp. and Jewell Ridge Coal Sales, Inc.

Executive Secretary — F. F. Estes, Wash., D. C.

Asst. Secretary-Treasurer — Mildred M. Lovelss, Wash., D. C.

The following six Class "A" directors (for terms expiring 1960) were elected:

D. K. Mackenzie — vice president, Castner, Curran & Bullitt, Inc.

P. F. Masse—vice president, C. H. Sprague & Son Co., Inc.

Evan Massey—president, A. T. Massey Coal Co., Inc.

W. H. Naylor—vice president, Pocahontas Fuel Co., Inc.

J. S. Routh—Chairman of the board, Routh Coal Export Corp.

George E. Owen—president, Imperial Overseas Coal Co.

Other directors include:

W. H. Carpenter—president, Dexter-Carpenter Coal Co.

A. F. Kempe—president, Seneca Coal & Iron Corp.

S. Pemberton Hutchinson—executive vice president, General Coal Co. (also Class "A").

J. R. Maust—president, Saljoan Coal & Coke Corp.

George McCree—president, Maritime Coal & Coke Corp.

Highlighting the business session, President J. S. Routh said that the American coal industry will continue to move heavy tonnages abroad over a long period of years regardless of whether further "fuel crises" develop in importing countries.

The 38 to 42 million tons of coal that will move overseas from this country in 1958 reflect "good business" for exporters despite a decline from 57 million tons in 1957. The drop in exports is due to the mild weather in Europe for the last two winters, plus the "apparent overcommitment by importers of coal occasioned by the Suez crisis."

Mr. Routh advised that the trend to larger colliers would stabilize the delivered price abroad. "Five years ago we were thinking in terms of the Liberty ship, carrying 10,000 tons; today we are thinking in terms of 14,000 to 16,000 tonners, and with the expansion of industry and energy requirements abroad, we are already starting to think in terms of 25,000-ton ships."

The assembled exporters were cautioned not to be too alarmed because Russia, Poland and Great Britain are seeking larger portions of the export market. "Let us not mistake commercial competition with political competition, since we know that we have the largest reserves, the ability to produce coal with excellent quality at a reasonable price and to service our foreign friends, no matter what quantity they ask of us in the future."

In a statement read for F. F. Estes (absent due to illness), the association's executive-secretary reassured the group that every effort would be made to minimize controllable losses in the export market. Notable on this count during the past year: In response to the association's plea, the State Department agreed not to allow Poland to use funds from a $97 million grant last February for purchasing mining machinery.

M. F. Bergan stated that the Transportation Committee would continue to press for maximum flexibility in tidewater demmurage schedules and rates. Other areas for improvement are more accurate information on the position of vessels, and faster car turnarounds at ports.

D. T. Buckley, chairman, government relations committee, noted that all U. S. export coal—except for relatively minor tonnages to Spain and Korea—was being financed without benefit of government aid.

NCA Committee Rollcall

Committee chairmen and their alternates reported as follows:

ATOMIC ENERGY—Kenneth A. Spencer declared policy would continue to:

1. Endorse an all-out program of atomic energy development for national defense, and peacetime purposes including nuclear power.
2. Recognize the need for government-sponsored research to aid fossil-fuel-short foreign countries and to further domestic nuclear-power development based on strictly competitive standards.
3. Encourage overseas competition which will provide markets for coal in the form of enriched uranium and which will stimulate U. S. atomic energy industries.

COAL ECONOMICS AND STATISTICS—With 98% of production reporting in 1957, the distribution statistics program is well underway, George E. Enos stated. Authorized has been a 5-yr forecast of production and consumption, which will be made available to NCA membership. Other projects include a supplies-cost index to become available by the end of June, more standardized production statistics terminology, estimates of the future electric power market for bituminous, Canadian-U. S. relationships in the movement of fossil fuels, and the reliability of bituminous price indexes.

COMPETITIVE FUELS—D. W. Buchanan Jr. said the drive would continue to serve coal's best interests in seeking appropriate solutions to the Harris natural gas bill, imports of Canadian natural gas, and imports of residual oil.

ENGINEERING—NCA staff engineers have saved the market for several million tons of bituminous in government and large-industrial-consumer installations, C. R. Griffith reported. Special note was made of much cooperative activity with other market-promotion groups such as BCI and BCR.

INTERSTATE AND FOREIGN COMMERCE—Walter F. Schulten appealed for greater active support in legislative matters, such as those involving railroad freight rates, passenger deficits, the transportation tax and the authority of the Interstate Commerce Commission.

LAND AND WATER USE—The most pressing problem today is water-pollution abatement and the possibility of mandatory governmental regulations, R. L. Ireland warned. Also he pointed out: Be constantly alert to zoning regulations as they affect strip and deep mining operations, and keep a watchful eye on air-pollution problems.

PUBLIC RELATIONS—NCA's program covers a wide variety of press, TV, advertising and other educational activities based on the premise that coal's future depends largely on the public's attitude. H. Vernon Fritchman drew attention to the most recent major accomplishment: Publication of "Bituminous Coal Facts, 1958."

RESEARCH—Harry LaViers reported his committee would continue seeking implementation of the proposal which aims to set up a special Federal agency for coal research.

SAFETY—S. Austin Caperton noted that, fatality-wise, March and April, 1958 were, respectively, the best and second-best months in recorded industry experience. The chairman asked for suggestions on where to hold the 1959 National First-Aid and Mine-Rescue Contests.

TAXES—Legislative projects including, for example, increasing the percentage depletion tax for coal and repeal of the transportation tax, have primarily engaged the committee's attention this past year, James A. Graham said. The Treasury regulations on natural resources are still incomplete and, apparently, they will not be issued in final form for at least several months more. Several cases decided this year indicate favorable court interpretation of the term "economic interest."

VOCATIONAL TRAINING AND EDUCATION—Needed most is better administration, better teaching and better training of all levels. To accomplish these objectives, Henry C. Woods called for special attention to teachers' salaries and high school education.

MEMBERSHIP—Despite the recession, Frank F. Kolbe reported, NCA has maintained its proportionated standing in the industry. Eight companies have been added to the membership rolls. Also, new-property production of a number of member companies has been included in assessment reports.

COAL CAR SUPPLY—Since early November, no car shortages have been reported, Joseph T. Berta stated. But a moderate upturn in business could bring shortages in a very short time. For the 12-mo period ending April 1, 1958, the railroads had a net increase of 15,211 hoppers. However, due to the large number of cars in for repair—35,518—the serviceable fleet has increased by only 114 cars.

RESOLUTIONS—Newton H. Debardeleben proposed and the assembled convention accepted resolutions which:

1. Endorsed NCA actions for the year ending June, 1958.
2. Thanked convention participants and committees.
3. Asked for mandatory controls on imports of residual oil.
4. Called on the House and Senate to implement subcommittee recommendations for a special Federal agency devoted to coal research.

The cement industry is in the process of expanding 40%. This means cement production will increase from 56 million tons in 1957 to 80 or 90 million tons by 1966. Coal-consuming cement plants, generally located in the northeastern states, and gas-consuming plants should share equally in the expansion. Coal use should grow 60% to 15.9 million tons; gas use should move up 60% to 230 billion cu ft.

Cement production will consume some 8 billion kwhr of electric power by 1966 requiring 3.4 million tons of coal equivalent energy]. And whatever coal can do to keep its costs down and contribute to cheap production of electricity will enhance its share of this market.

Gordon R. Corey, vice president, Commonwealth Edison Co.

In the last 12 yr, Commonwealth Edison has increased coal use by 33%. Twelve stations consumed 10 million tons in 1957. During the next 12 yr, CE's coal needs should increase by another 5 to 10 million tons, assuming that nuclear power does not become economically feasible and that there is no great change in combustion efficiency.

Two factors may change the pattern of future coal consumption:

1. If mine-mouth generation and long-distance, high-voltage transmission become generally feasible, plants so-based may compete with nuclear power for many years to come.

2. If plans work out as hoped, coal and electric power will become partners in expanding the electric home-heating market to 1,800,000 homes by 1965. Electric power needed for heating and other concomitant uses would require 11 tons of coal annually per home. [Retail tonnage thus recaptured

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for coal would be of the order of 19.8 million tons].

B. J. Fletcher, vice president and general manager, Aluminum Co. of America.

In the last 10 yr, the economies of coal production and rising transportation costs have caused a migration of aluminum smelters to coal-mining areas, notably, the Ohio River Valley. Coal-power costs less than hydro or gas; also, large blocs of coal can be purchased to supply long-range future needs.

By 1960, one-third of aluminum capacity should be based on coal. Annual production will thus consume about 6 million tons of coal. Looking further ahead, coal's position appears strong if prices can be kept down. Primary aluminum production in 1975 will be 3½ times the 1957 rate of 1,650,000 tons. Domestic water power will stay in the picture but supply a smaller percentage of total energy needs. Low-cost foreign hydro, based near bauxite deposits, may take on importance. Gas use is not expected to increase.

Charles L. Potter, supervisor, Raw Materials Div., Jones & Laughlin Steel Co.

Steel will remain a substantial customer for coal. For coke, electric power and other uses, some 132 million tons of coal will be needed in 1965, compared to 116 million tons in 1957.

The declining coke rate ["More Steel Per Ton of Coal," *Coal Age*, May, 1958, p 54] puts coal in an advantageous competitive position as the steel industry increases capacity and plans for direct reduction. Inroads by direct reduction will be limited because of increasing efficiency in coal use, of the heavy investment in blast-furnace operations, and the opportunities for further cost-saving modifications in conventional processing techniques.

BCI Reports

The Coordinated Program of Coal Sales Engineering, **R. L. Ireland,** president, Bituminous Coal Institute.

This is the era of the "Big Sell." And to achieve the Big Sell, bituminous must be more unified in its approach to the marketplace than its competitors, the fluid fuels. Coal, in other words, must seek closer coordination, correlation and integration of all agencies.

The sales engineering approach brings the greatest payoff in cooperative effort. Toward this end and primarily through its Staff Coordinating Committee, BCI is working closely not only with ACSA, ARCA, ASFE, BCR, CPCSA and NCA, but also with coal producer and retail coal associations in all of its 15 districts.

How and Why the BCI Program Works, **Carroll F. Hardy,** managing director, Bituminous Coal Institute.

The whole answer to "How and Why the BCI Program Works" is tied up in two factors: (1) BCI's operating procedure, and (2) the personal element represented by BCI district and Washington staff members, and by the unpaid but invaluable district committeemen (*Coal Age*, January, 1957, p 54).

Most of the calls recorded in 18 mo of operation have been productive, and the rate of calls has stepped up from an average of 49.4 calls per man per month in the first year, to an average of over 60 calls in the last 6 mo. As a result of calls in the last 6 mo, 316 projects were gained or retained for coal, representing a volume of 3,500,000 tons of coal; projects lost to other fuels represented less than 500,000 tons.

Activities of BCI District Engineers and Managers, **Harry C. Ballman,** manager, Field Engineering Services.

From reports on nearly 13,000 calls made between October 1, 1956 and March 30, 1958, the following conclusions can be drawn:

1. Plants originally coal-fired and then converted to fluid fuels are now turning back to coal.
2. More architects are considering coal and calling on BCI for help.
3. There is an increasing trend to visit plants for "trouble-shooting," on the assumption that, if something is not done, the plants will be lost to a competing fuel.

Engineering Development Activities, **Charles H. Marks,** manager, Development Engineering, Bituminous Coal Institute.

The BCI development engineering group—formerly consisting of two engineers, now includes the manager, two engineers (with a third due to be added), and a draftsman. The expanded staff will strengthen BCI's ability to prepare the general technical material needed for successful district activities and special field projects.

Future plans include continuing the series of Guide Book Specifications, preparing a Field Engineering Handbook for consulting and fuel engineers, and publishing brochures on coal and ash handling, coal storage, and application of coal-firing equipment to high-temperature, hot-water heating systems.

Coal Promotion on a Nationwide Basis, **M. L. Patton,** executive vice president, Bituminous Coal Institute.

Even on a short-range basis, the BCI program has shown sufficient wins and tonnage "gained and retained" to justify its existence. The long-range good is incalculable. For the first time, the coal industry is meeting its competition squarely face-to-face, with hard engineering facts. It is showing fuel users that coal is the modern, safe, low-cost fuel that can stand on its own feet in competition.

Progress is being made but BCI still faces a tremendous job. It can be done with sufficient financing and with full cooperation from coal and related industries. Particularly helpful will be the multiplication of BCI efforts through the cooperation, coordination and enthusiasm of voluntary co-workers.

NCA Management

President—**Frank F. Kolbe,** president, United Electric Coal Cos.

Vice Presidents—**H. Vernon Fritchman,** vice president, Rochester & Pittsburgh Coal Co.; **Harry LaViers,** president, South-East Coal Co.; **K. A. Spencer,** Pittsburg & Midway Coal Mining Co.; **Mark E. Eastin Jr.,** president, West Kentucky Coal Co.

Executive Vice President—**Tom Pickett**

Treasurer—**George E. Enos,** president, Enos Coal Mining Co.

Secretary and Assistant Treasurer—**Thomas Howarth**

Directors now include:

J. S. Besser, sales manager-fuel, The Colorado Fuel & Iron Corp.

C. R. Bourland, president, New River Co.

D. W. Buchanan Jr., president, Old Ben Coal Corp.

S. J. Dickenson, secretary-treasurer, Mary Helen Coal Corp.

C. C. Dickinson, president, Dickinson Fuel Co.

F. Stilman Elfred, chairman of the board, Peabody Coal Co.

George E. Enos, president, Enos Coal Mining Co.

Barton R. Gebhart, vice president, Freeman Coal Mining Corp.

Chas R. Griffith, president, Southern Coal & Coke Co.

C. A. Hamill, president, Sycamore Coal Co.

H. C. Livingston, president, Truax-Traer Coal Co.

J. R. Maust, president, Tioga Coal Corp.

Ralph H. Moore, vice president, Rich Hill Coal Mining Corp.

William Osborne, president, Youghiogheny & Ohio Coal Co.

L. Newton Thomas, president, Carbon Fuel Co.

Robert P. Tibolt, executive vice president, Eastern Gas & Fuel Associates.

Richard T. Todhunter Jr., president, Barnes & Tucker Co.

Wilfred S. Webster, vice president and general manager, Walter Bledsoe & Co.

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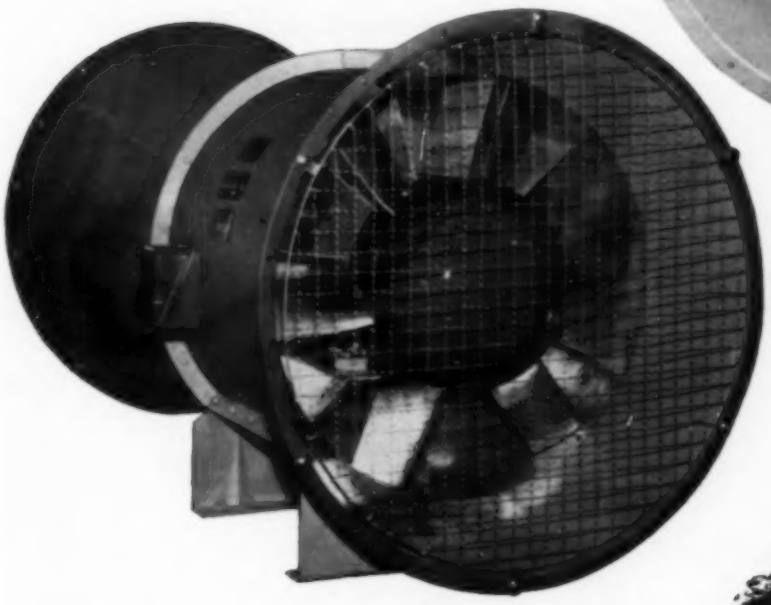

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Jeffrey maintains a capable engineering staff for solving mine ventilation problems. Their recommendations may call for the smaller Type 6-F AERODYNE® fan, offering these features:

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- **Fan wheel mounted on shaft of standard foot-mounted motor.**
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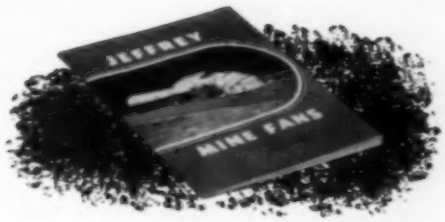
- **In addition to built-in motors, also available with overhung drive and fan wheel for drives up to 125 HP.**



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INDUSTRY MEETING—A Special COAL AGE Staff-Written Report

CONVEYING V. HOISTING, DEFENSE MINERALS—V. C. Smith (left), co-chairman; H. O. Zimmerman, Inland Steel Co.; W. H. Diamond, Island Creek Coal Co.; W. J. Skewes, chairman; R. A. Laurence, USGS.

POLLUTION, VENTILATION, PLUGGING WELLS—John Kolasky (left), Eastern Gas & Fuel Associates; B. N. Finch, petroleum consultant; C. W. Connor Jr., chairman; Henry Hebley, Consolidation Coal Co.; C. S. Crouse, co-chairman.

Central Appalachian Section, AIME, reviews

Today's Mining Practices

SLOPE CONVEYING V. HOISTING for deep seams, the defense minerals exploration program, pollution, face ventilation for continuous miners, sealing oil and gas wells in coal fields, hydraulic transportation and the cost of coal to power plants were key topics at the spring meeting of the Central Appalachian Section and Coal Div., Society of Mining Engineers, AIME, Lexington, Ky. June 13-14. George W. Hubley Jr., Head, Dept. of Economic Development of Kentucky, was the speaker at the dinner session, with S. M. Cassidy, vice president, Consolidation Coal Co., as toastmaster. Following are abstracts of the papers at the fuel sessions.

Slope Conveying v. Hoisting for Deep Seams, W. F. Diamond, manager of engineering, Island Creek Coal Co.

Two methods of bringing coal to the surface from deep seams are available now. With the development of new and improved types of belting, the length of a belt that can be considered has increased. A cable belt developed in England warrants considerable attention for lifting coal from deep seams. This type of conveyor uses two wire ropes to take the driving force, rather than relying on the belt itself to do the job. The belt carcass is supported by the ropes.

Terminal machinery with the cable belt is more expensive than for a conventional belt, and therefore this type conveyor is not attractive for short lengths. But at lengths of 3,000 ft or more the price makes them attractive.

The cable units use less driving power than a conventional belt conveyor. Another advantage is that spillage along the conveyor line is less. It is possible for a cable belt to handle 900 tph while elevating from depth of 1,400 ft.

The second method of bringing coal from deep seams is the Koepe hoist. None is used for hoisting coal in this country primarily because the seams mined now are not deep enough.

Advantages of the Koepe unit included: (1) the possibility of using several parallel ropes to divide the load; (2) small, compact design, so that the hoist can be installed in the head frame; (3) increased safety because of multiple ropes; (4) less rope wear; (5) less wear of shaft guides; (6) lower initial cost and (7) lower power consumption.

The Defense Minerals Exploration Program in the Eastern States, R. A. Laurence, USGS. To come under the DMEA program a mineral must be on the approved list, there must be a definite objective in developing the ore and the cost must be within reason in relation to the return.

If a discovery proves good, repayment of DMEA funds is by royalties starting during the exploration stage. In some instances, the money has already been repaid from royalties.

In general, the program has been a very satisfactory way of discovering strategic minerals. For every dollar spent in the program, $25 has been returned in minerals discovered.

The Seriousness of the Pollution Problem, Henry Hebley, research engineer, Consolidation Coal Co.

Suspended solids and acid water are two major pollution problems of the coal industry. Some of the recommendations of the engineering committee of ORSANCO to decrease the acid water problem include diversion of surface water to prevent inflow, rapid removal from the mine of any inflow, care in refuse disposal, uniform rate of pumping, sealing of openings and treatment of acid-water drainage.

If the proposed rules and regulations for control of acid-water drainage as set forth by a sanitary engineer from an eastern university are adopted, coal companies could have a serious problem.

The present standard of 1,000 ppm of solids as applied to wash water being emptied into streams is believed to be not stringent enough, according to the Pennsylvania Sanitary Water Board. The new proposed standards vary with the acidity or cleanliness of a stream. For example, effluent to a clean stream, as defined by law, must be adjusted to neutrality and must contain no more than 200 ppm, or 1/50 of 1%, of solids.

Face Ventilation for Continuous Miners, John Kolasky, ventilation engineer, Eastern Gas & Fuel Associates.

A single rapidly advancing continuous miner face in a gassy mine contains in concentrated form the ventilation problems normally met over a wider area in a conventional setup. And the problems are met at a much faster rate. In developing with conventional equipment, the time to bleed off gas exists because of the intermittent rate of exposing new faces. A line curtain could be hung practically to the face if necessary.

Various types of continuous miners are

Why it will pay to invest in heavier rail

For some time now, authorities have been predicting that the "Billion-ton Year" will arrive by 1975, with the bituminous output topping 600 million tons per year by 1960!

To the deep-mining bituminous companies, attainment of this latter production rate will necessitate increased output of something like 17 pct over the next two years. A pretty sharp rise for so short a time; how will it be met?

Not with outmoded, light-weight haulage systems, that's sure. More powerful locomotives, heavier loads and higher speeds will play an important part, and they will need 85-, or 90-, or even 100-lb rail to roll on. They also call for a new look at turnouts, crossings, and general layout design. Right there is one phase of modern mining where you can get all the professional help you'll need. Bethlehem's staff of engineers are deep in experience on haulage problems, and ready to tackle your particular problem with you. We'll design a complete layout for you, right down to the last joint bar. All necessary parts are accounted for, all rail cut to exact length and curved to proper radii. All critical parts are carefully preassembled on our own shop floors to be sure of perfect fitting.

Wouldn't it be a good idea to do some thinking about heavier rail? And wouldn't it make sense to discuss your thinking with a Bethlehem engineer?

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

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BETHLEHEM STEEL

PUMPING SOLIDS, COAL COST – W. E. Foreman (left), Virginia Polytechnic Institute; David Springston, Western Machinery Co.; E. H. Roberts, chairman.

used at Eastern Gas & Fuel's mines in varying mining conditions and in mines liberating different volumes of methane. The common methods of face ventilation employ jute or plastic brattice material for line curtains, stoppings and checks.

Current practices require testing for methane every 15 to 30 minutes with a flame safety lamp. Company standards require that ventilation be improved if analysis of air in a split shows more than ½% methane. Approved methane detectors are used daily by officials to check the concentration of gas. Weekly samples of return air in each section are tested in the laboratory.

Minimum volumes for a split of air in various seams and with different types of machines are as follows: 20,000 cfm, Pittsburgh seam, boring-type machine; 18,000 cfm, Pocahontas No. 3 seam, ripper-type machines; 18,000 cfm, Kittanning seam, ripping and boring machines in development and retreat.

In the Pittsburgh seam, where a Goodman machine is employed, line curtains are secured to the roof and rib with spads on 2-ft centers. Rib spads are placed above the floor so the pickup loader can do a thorough cleanup job without disturbing the line curtain. The line curtain is maintained to within 16 ft of the face and excess curtain is stored on the machine to be fed out and hung as the miner advances.

Intake air enters through the smaller area and keeps the line curtain away from the rib. About 6,000 cfm is carried to the face from a total of 12,000 cfm flowing through the last breakthrough.

In the Pocahontas No. 3 seam, using a ripper-type machine, two passes are made in entry development to get the desired loading width. A 6-ft advance is made along one side. Then the machine must be moved over because of the difficulty of removing gas from the pocket. A line curtain is advanced at the same time temporary cross bars are set on jacks. After advancing 32 ft the miner is moved out so roof bolts can be installed. Approximately 4,000 cfm of air sweeps the face at all times.

At the operation in the Kittanning seam, eight headings are driven on 80-ft centers with breakthroughs spaced similarly. The boring unit mines the center and left sides of the entry and the ripper unit extracts the right side. Pillars are recovered in a flat line. Gas and roof conditions permit a 12-ft advance before a line curtain and safety timbers are installed.

Plugging or Sealing Oil and Gas Wells in Coal Fields, Byron N. Finch, petroleum consultant.

Plugging or sealing abandoned oil or gas wells is a mutual problem of the oil, gas and coal industries. West Virginia and Virginia have laws regarding the proper procedures for plugging abandoned wells but Kentucky does not.

West Virginia and Virginia regulations require maps showing the well location, a profile of the strata intersected, and a work order showing the method of sealing. After plugging is completed, an affidavit is prepared and copies given to the owner, coal company and state.

If a well to be abandoned passes through a coal bed regulations require it to be filled to within 40 ft below the coal. Then there are two alternatives; (1) use a vent pipe no smaller than 2 in; (2) seal from 30 ft below to 20 ft above the coal bed with a nonporous material. After the last coal seam is sealed, the top of the hole must be plugged and a permanent marker erected over it on the surface.

Hydraulic Transportation of Solids, David Springston, Western Machinery Co.

New techniques, materials and equipment are contributing to the growing use of hydraulics for transporting solids. Recent success in pumping coal over long distances has created new interest in the idea of pumping coal from inside the mine to the preparation plant. To check the feasibility of this idea, the Wise Coal & Coke Co., Dorchester, Va., set up a small test circuit.

The test circuit is designed so that a slurry could be recirculated by a 6-in Wemco solids pump through some 900 ft of 6-in pipe to duplicate conditions that could be expected in a longer pipeline from inside the mine. Test batches of 3x0 and 1½x0 of about 4,500 lb each were introduced to the circuit at a rate of 800 gpm.

Line velocity dropped sharply on addition of coarse solids. At 7½ fps the coal did not stay in suspension and tended to drag along the bottom of the pipeline. This problem was overcome by adding some 8Mx0 fines to increase the specific gravity and increasing pump speed. At 15 fps the solids stayed in suspension. To date, degradation is excessive and further testing will be required before conclusion can be made. It is probable that degradation caused by recirculation would be reduced in a large scale installation. This was the case at Hanna Coal Co., which experienced more degradation in their pilot project than in the final pipe line.

Hanna also employs pumps to transport plant refuse. More equipment will be added so that a total of 500 tph of 1½ x 0 refuse can be handled. Two Allen-Sherman-Hoff 14x16 dredge pumps in series will push refuse through 3,600 ft of pipe.

Sunnyhill Coal Co. has a similar operation where three Barrett Haentjens 10x12 pumps are used in series to deliver 2,600 gpm of slurry containing 200 tph of 1¼x0 refuse. This material is pumped through 2,000 ft of special-alloy cast-iron pipe.

The new Wemco torque-flow solids pump eliminates the use of the conventional impeller. It operates by transmitting power to a fluid pulp much like a fluid-type torque converter. The design incorporates a fully recessed impeller and eliminates flow through impeller vanes which is necessary in most conventional pumps. The unit will not clog and makes possible the pumping of coarser coals and refuse.

Some Factors That Affect the Price of Coal to Power Plants, W. E. Foreman, assistant professor of mining engineering, Virginia Polytechnic Institute.

Data from the National Coal Association on the steam-plant fuel consumption and costs for 1954 were plotted on a map showing actual fuel costs of coal consumed by power plants in the United States. A study also was made of the freight-rate structure and actual cost of transportation of coal from mines to large consumption areas.

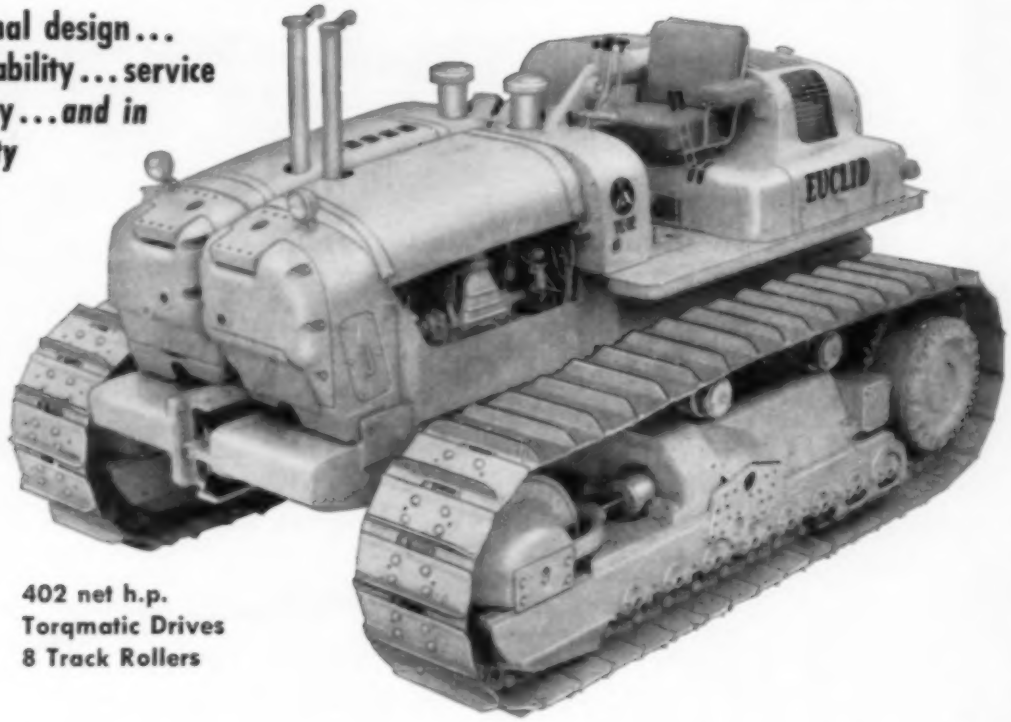
Rail haulage accounts for 78% of the coal being transported. Two misconceptions sometimes arise in considering freight rates: (1) From any given point freight rates increase similarly in all directions, and (2) freight rates always increase with distance.

Since 1940 progress has been made in adjusting freight rates in the various regions, so that they would be the same for most areas having the same traffic flow. Reasons for the differences in rate structure are (1) efficiencies in mass movement should warrant lower rates where heavy traffic occurs; and (2) competing methods of transportation, such as waterways, tend to keep rates competitive.

New Series *Euclid TC-12* . . .

now even further ahead of other crawlers

in functional design . . . maneuverability . . . service accessibility . . . *and in work-ability*



402 net h.p.
Torqmatic Drives
8 Track Rollers

Ever since the TC-12 was introduced, there has been no question about its top performance ability —even on the toughest crawler jobs. Now with over 3 years of field experience on practically every kind of operation, major product improvements make the new TC-12 better than ever.

Powered by two engines, there's a total of 402 net horsepower delivered to the power train through separate Torqmatic Drives for each track. Big 27″ shoes and 8 rollers give the TC-12 good balance with or without heavy duty dozer blades and other mounted equipment. Bare weight of the tractor has been increased to 67,000 lbs. as a result of heavier construction and more rugged components throughout.

With independent track drives, there's no dead track drag when turning—maneuverability of the big TC-12 with its full power shift saves seconds on every cycle whether push loading scrapers, dozing or pulling big equipment. With unitized assembly, good design of component location and equipment mountings, this "Euc" provides easy accessibility for service and maintenance.

Have your Euclid dealer give you all the facts on the new TC-12 . . . you'll find its your best buy by far where big tractor performance is needed.

EUCLID DIVISION of GENERAL MOTORS, CLEVELAND 17, OHIO

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EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

Foremen's Forum

Emergency Action

YOU WILL GET HELP in a hurry in the event of an emergency. Are you prepared to make the decisions and take the actions that will mean maximum safety for your crew until the help arrives? You will be a more effective leader if you are prepared.

Diligent study, intensive training and careful planning eliminate panic and promote decisive action. Your men will look to you for leadership when the pressure on you is at a peak. Prepare now.

ARE YOU PREPARED to lead your crew to maximum safety in the event a fire or explosion occurs at your mine? Other foremen have found themselves in this situation. In one recent instance, a foreman took charge and saved the lives of the 13 men in his crew by knowing how and where to build barricades. They retreated behind the barricades and were found by rescue teams. In similar situations, men have been suffocated by afterdamp while trying to escape following an explosion. Consider with us the subject of emergency action.

Bureau of Mines' Miners' Circular 25 contains this statement: "Usually, in every crowd there is a cool-headed man who is able to take charge of a lot of excited and more or less terror-stricken men, and he should be obeyed for the common good." This observation carries a special meaning for mine supervisors. If an emergency does occur you automatically should be that cool-headed man, and you will find all your men looking to you for advice as to what their next move should be.

Years ago a disastrous explosion took many lives at an American mine, but 47 others were rescued four days after the catastrophe because they were ruled by common sense and did not succumb to panic. Speaking of the rescued men, Circular 25 says this: "The brattice work done by these 47 men was excellent, their foresight in short-circuiting the air was correct, and their conduct was sane and courageous." This is high praise, well-deserved.

Fear and apprehension are natural human responses when grave danger threatens, but panic is unnatural. Panic results when men are not prepared for danger and lack leadership.

Unpreparedness in turn is a result of lack of knowledge, neglected training opportunities or poor planning. Each of these conditions may exist in various degrees, as follows:

In respect to knowledge, the various degrees are:

1. No knowledge of conditions before or after an emergency.
2. Adequate awareness of conditions before an emergency, but only a hazy notion of what might exist after a fire or explosion.
3. A rather complete knowledge of normal mine conditions and well-developed knowledge of what might be expected after a fire or explosion.

Regarding training opportunities, these conditions may exist:

1. Absolute indifference to all safety training.
2. Half-hearted preparation—skipping most training opportunities, taking advantage of some but dreaming or "doodling" while the program is being presented.
3. Conscientious effort to absorb knowledge on conditions before and after mine emergencies and to assimilate the experience of others who have faced the situation.

From the planning standpoint, the degrees are:

1. No emergency plans whatever, and a willingness to gamble that "it won't happen here."
2. Half-made plans with a lot of important details left out.
3. Complete emergency plans based on recognition of the hazards that accompany and follow a fire or explosion.

The closer you approach the third degree in each of these categories the

Smooth-gliding POWER for mine locomotives!

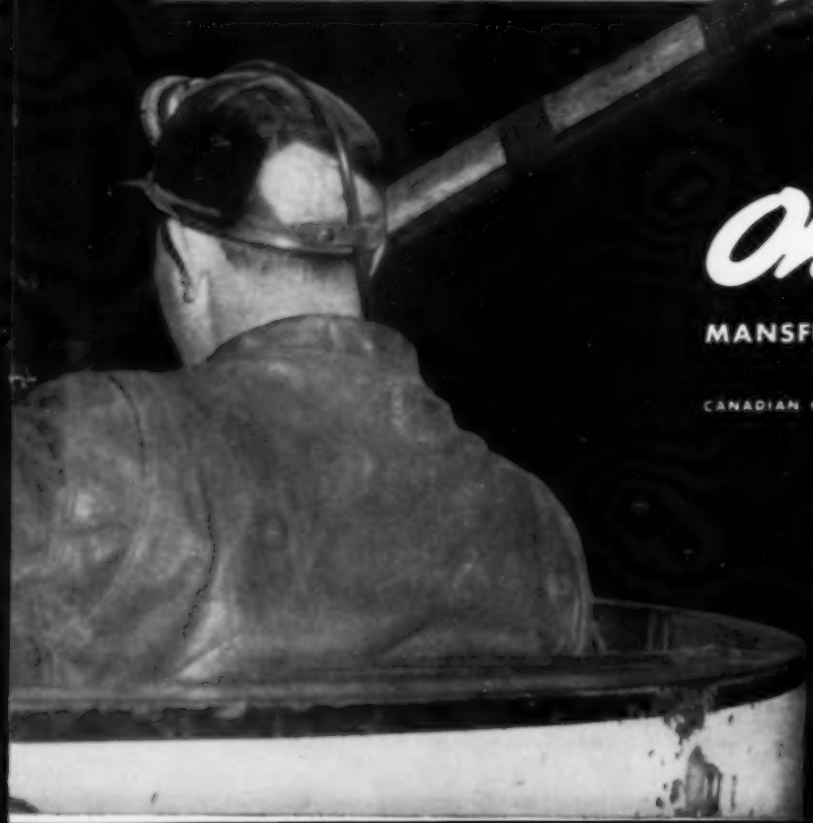
O-B Type-EHD Current Collectors

We built this one for the big locomotives—those weighing from 35 to 50 tons and drawing currents up around 3000 amperes. But you'll find this new O-B Collector on much smaller locomotives too.

Why? Because it's the smoothest gliding, longest wearing collector ever designed for a mine locomotive! It practically steers itself through frogs, crossovers, and switches that cause other collectors to dewire unless guided by hand.

Motormen aren't the only ones who like the Type-EHD. Maintenance men and the men who pay the bills like it too, because the longer, heavier glider lasts up to 100 per cent longer in heavy-duty service than anything used previously!

Order Catalog Number 22553 today—get more efficient, more economical current collection tomorrow!



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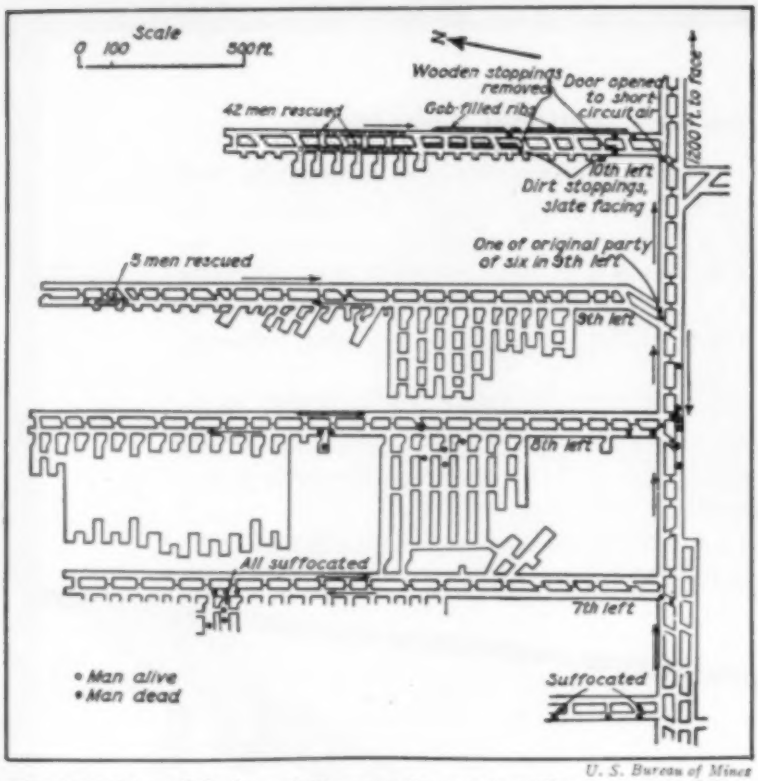

U. S. Bureau of Mines

BARRICADES saved the lives of 47 men in these sections. They were rescued four days after an explosion had occurred. Others lost their lives.

cooler your head will be if you are ever called upon to lead men to safety from a stricken area.

Here are suggestions for preparing for the worst a mining man can imagine—a fire or explosion.

Getting Information

Review the material you studied in preparing for your state examination—then review the examination.

Study the posters displayed at your mine outlining the responsibilities of the staff.

Secure a good textbook on mine ventilation and study it to become familiar with the principles that govern air movement in coal mines.

Consult Bureau of Mines publications for recommended practices. Your federal inspector will help you select pertinent literature.

Confer with your state mine inspector to get a good picture of local conditions and the history of mine-rescue operations in your region.

Talk with men who have had experience in combating mine fires or explosions. They will remind you of details that otherwise might escape your attention.

Keep abreast of development in your mine by studying the mine map, giving special attention to changes in ventilating circuits, pressures and volumes that result from expansion of the underground workings.

Investigate the subject of barricades. Know why, when, where and how to build them.

Absorbing Training

Take advantage of first-aid and mine-rescue training, making every effort to absorb all the skills and knowledge offered. Every training session offers something of value for every man in attendance. If you pay strict attention you will find your interest aroused, and you will begin to ask questions. When you ask questions you are learning. Above all, don't leave a first-aid or mine-rescue training session with unanswered questions in your mind—the subjects are too important.

Read and study such information booklets as the question-and-answer tract prepared by the National Mine Rescue Association.

Watch others in training because demonstration is one of the elements of good instruction.

Making Plans

The knowledge you have acquired and the training you have absorbed can now become the basis for intelligent plans that will help you confront any emergency in a "sane and courageous" manner.

You will know your mine and its ventilating system. Through study of the ventilation map you can determine the effect of damaged or blownout stoppings on the air supply to your section. Plan your line of escape with due regard for air-supply derangements.

You must know at all times the position of your men throughout your section so that you can assemble them quickly in emergencies. Know where barricading supplies and necessary tools can be found. You may need food and water, so take it with you as you make your escape or as you retreat to your barricade site. If you lead a group under these circumstances consider conservation of your cap lamps and safety lamps.

Remember to leave a note in a main opening if you find it necessary to enter a barricade. This will help rescue crews.

The decision as to whether you should try to escape to the surface or erect barricades will be a difficult one to make. Remember that if the fire is out by your section you will likely encounter smoke in the intakes. If you decide to try an escape you will have to travel the return airways. But you will have to get ahead of the smoke and afterdamp and stay ahead of it. You can't turn back once you have committed yourself.

A useful aid in planning is transparent tracing paper. Lay it over your mine map, trace the outlines of your section, knock out some stoppings and draw the new ventilation pattern. This will help you predict changes in air currents that might affect your safety later.

The list of details you must consider in your planning could be expanded to great length. You will recognize many others as you study mine conditions before and after fires and explosions, and as you hear the experiences of mine-rescue veterans. Include provisions for handling these details in your plans.

The advantages you gain from intensive preparation for the worst possible situation are important to you and your men. You may save lives by prompt correct action, you may be instrumental in protecting valuable property by doing the right thing at the right time and, last but not least, you may be able to prevent disasters through the knowledge and training you have received.

More capacity, less weight, longer service life, and lower costs—these are the advantages you get by using USS "T-1" Steel in mining equipment.

Dippers that ram through rock

built stronger, tougher and lighter with USS "T-1" Steel

Did you ever cling to the "crow's nest" of one of the new giant shovels and feel it ram into a wall of rock and shale? The big machine shudders, then braces its feet and digs in with all its tremendous mechanical muscle. The dipper becomes a real battering ram—and you wonder how any steel can stand such punishment, day after day.

United States Steel engineers and metallurgists asked the same question, and developed a special steel, USS "T-1" brand. This steel can take terrific shock and impact abrasion. It's extremely tough—even at 50° below zero. And it is now available with more than three times the yield strength of structural carbon steel—100,000 psi minimum.

This great strength permitted a weight saving of 40 tons in one large shovel where "T-1" Steel was used in the dipper, dipper stick, bail and crowd rack. In spite of the high strength, shovel manufacturers had no difficulty welding, forming and machining this quenched and tempered alloy steel.

USS "T-1" Steel can help you. Consider it where you need a steel with great strength, extraordinary toughness, or resistance to impact abrasion combined with ease of fabrication. Write for our book *USS "T-1" Steel*. United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

Immediate Delivery. USS "T-1" Steel products are now immediately available in minimum mill quantities. Reason: our new continuous heat-treating line is now in full operation. It assures better delivery as well as top quality.

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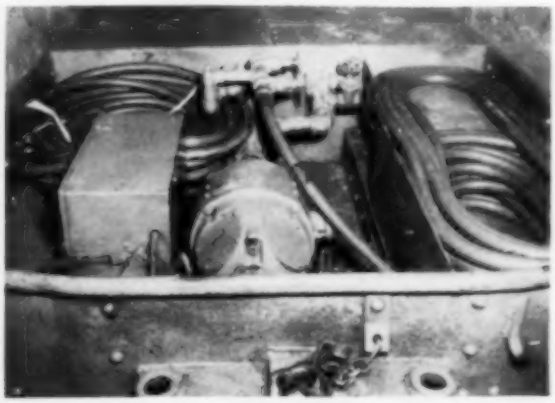
Operating Ideas



Mine Cars Converted to Effective Fire-Fighting Units

FIRE - FIGHTING EQUIPMENT is strategically located underground in all Inland Steel Co. mines at Wheelwright and Price, Ky. Part of this equipment consists of fire-fighting units, which were made in the company's own shop from parts readily available around the mines. Each of these units consists of a water car and a combination tank-and-pumper car.

The combination car is divided into two equal sections; one part holds the pump, valves, hoses and tools, and the other contains water. A high-pressure centrifugal pump, similar to the type used on a Jeffrey Colmol's spray system, delivers water at 100 psi to a 1-in hose line. The pump can throw a stream of water 75 ft through a ⅝-in nozzle. A bypass valve, set at 100 psi, is included in the pumping circuit so that pressure will not build up if the nozzle is closed while the pump is running. The pump is driven by a 7½-hp 1,750-rpm 250-V DC compound motor equipped with an Ohio Brass starting box.

Each fire-fighting unit is parked in a special stall which is kept free of all other equipment. In addition to the fire cars, each station has a complete set of standard tools, earmarked for fire fighting only.

A feature of the pumping circuit is that water may be drawn either from the tank or from a nearby sump. It may be discharged through the hose or diverted to fill the tanks. This flexibility in operation is achieved with four valves in the pipe circuit. A 10-ft length of 2-in hose is carried on each car for use in refilling the tank or pumping directly from a sump to a fire.

Flexible Carrier Speeds Equipment Moves

A 90% REDUCTION in moving time, elimination of damage to equipment and prevention of accidents are some of the benefits of an equipment carrier designed by Anthony Shacikoski, Avonmore, Pa. An important feature of the carrier is its ability to be shifted left or right on its skid base so that a machine can be eased through areas where there is a minimum of clearance. Mr. Shacikoski says that the carrier is particularly useful in mines which were opened before the advent of off-track equipment and where conditions make equipment moves troublesome.

The carrier consists of a base made up of two flat skids which are 30 in long and connected by a drawbar, and a machine-support section. The length of the connecting drawbar between skids depends on the wheelbase of the equipment to be carried.

The machine-support section consists of two bolsters, each resting on one of the skids. One bolster is fitted with permanent and the other with removable shoes which hold the machine in place in the carrier. The machine to be transported rests on the bolsters, which can be shifted from side to side on the skids where clearance is a problem.

Two runways connect the bolsters and provide a track for shuttle car wheels during loading. After a unit is loaded, the two removable shoes are bolted in place at the ends of the runways to keep the machine from moving in transit.

Small built-in water tanks made of 4-in pipe are mounted in front of the forward skid to drop water to the rails and reduce friction while a machine is being moved. A piece of belting rides the rail ahead of the skid shoe and cleans sand off the rails. If the haul is long, a barrel of water can be carried in a car and water fed to the tanks with a hose.

If the height of the headings is not sufficient to permit a shuttle car to pass through, Mr. Shacikoski says that the wheels can be removed from a shuttle car and the unit hauled equally as easily without them.

US RUBBER CONVEYOR BELTING

AUTOMATION GOES UNDERGROUND

"U. S." Belts help make a push-button conveyor system foolproof

Automation is spreading day by day in the coal mines. For example, in the Dana Slope Mine of the Amherst Coal Co. (Rensford, West Va.), the conveyor system, equipped with U.S. Rubber Belts, operates entirely by push button. The limited storage capacity, both inside the mine and on the surface, makes it mandatory that the slope conveyor operate without interruptions. Any stoppage would quickly tie up the mine and stop production.

Obviously, an automatic conveyor system is only as good as the belting it uses. That's why Amherst selected "U.S." The reputation of "U.S." Belts for dependability and long-life economy was Amherst's best guarantee of trouble-free coal-handling. And their judgment has been proven correct.

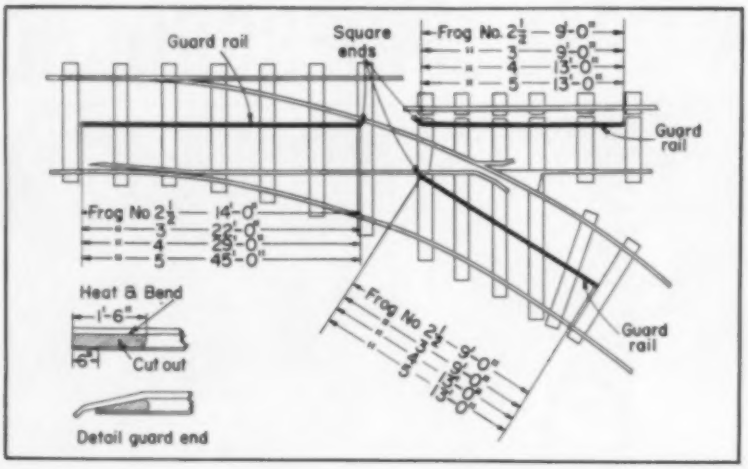
This 986-ft. slope belt, for instance, is a 42" U.S. Giant® 6-ply YN belt, operating at a 16-degree incline. Installed in 1952, it has given a trouble-free service and is outstanding in troughability, training and resistance to abrasion, shock, cutting and gouging. It is expected to last many years.

A complete line of U.S. Belting, to handle any materials-handling problem, is available at your local "U.S." Distributor, or write us at Rockefeller Center, New York 20, N. Y. In Canada, Dominion Rubber Co., Ltd.

US RUBBER Mechanical Goods Division

United States Rubber

See things you never saw before. Visit U. S. Rubber's New Exhibit Hall, Rockefeller Center, N. Y.



Guard Rails Check Costly Car Wrecks

GUARD RAILS installed at all switches in Harmar Coal's Oakmont mine prevent serious wrecks if a mine-car door should drop in transit. If your mine uses drop-bottom cars and you plan to install guard rails, this sketch can be useful in selecting the proper length of guard to use with the various sizes of turnouts. For example, a No. 2½ frog requires one 14-ft and two 9-ft sections of rail; and a No. 5 frog calls for one 45-ft and two 13-ft sections of rail.

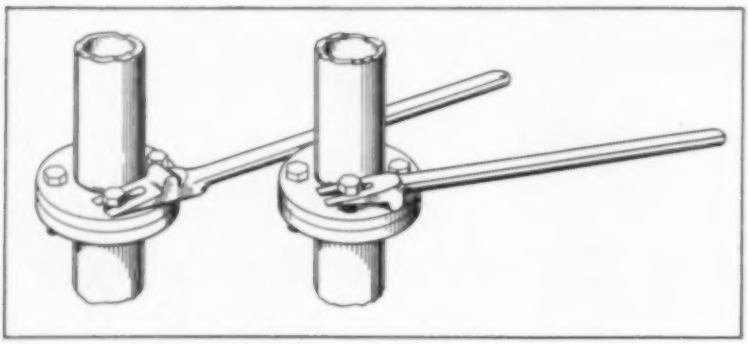
Special Truck Delivers Clean Lubricants

DELIVERING clean lubricants to strip mining equipment is no problem at the Robbins Coal Co., Oneonta, Ala. A special truck travels about the pits and transfers oils and greases directly from the original drums to the machines. The net result is longer life for bearings and moving parts on the various machines because lubricants are free of abrasives.

Oil drums are lifted into a Ford F-700 truck by a Stratton 2-ton Hydro Crane. Each drum has its own Stewart-Warner air pump that transfers the lubricant to the machine via a hose. A standard shop compressor, powered by a gasoline engine, provides air for the pumps.

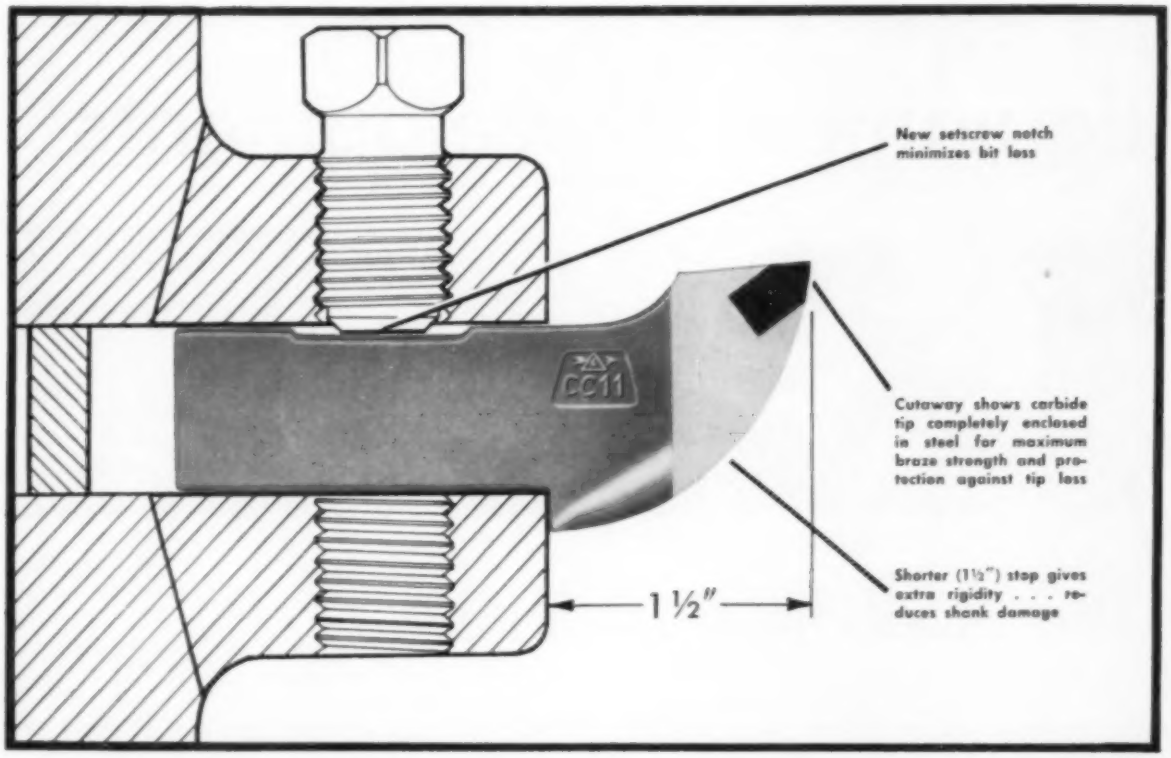
The lengths and diameters of the various hoses vary according to the type of petroleum product they carry and the type of equipment served. For example, grease hoses are 40 ft long, oil hoses are 20 ft, diesel fuel 100 ft and gasoline 30 ft. There is a metering device at the discharge end of each hose.

The front section of the truck bed has a two-compartment tank divided to hold 650 gal of diesel fuel and 100 gal of gasoline. Drums of the following petroleum products are carried on the truck: SAE 90 transmission grease, SAE 140 transmission grease, Super HD 30 motor oil, HD 30 motor oil, MS2 grease, and fabric grease.



Pry Bar Removes Tight Bolts

HERE is one of the handiest pry bars that any maintenance man can add to his kit of tools, writes Charles H. Willey, Penacook, N. H. Stubborn bolts can be loosened with the flat side of the bar, then the bar can be turned over so that the heel is down. In this position, the heel can be used effectively and the bolt can be forced out.


New setscrew notch minimizes bit loss
CC11
Cutaway shows carbide tip completely enclosed in steel for maximum braze strength and protection against tip loss
Shorter (1½") stop gives extra rigidity . . . reduces shank damage
1 ½"

NOW—A CARBOLOY® ENCLOSED-TIP BIT WITH 1½" STOP FOR EXTRA TOOL LIFE

The new Carboloy CC-11 enclosed-tip bit has all the famous features and stamina of the Carboloy CCS-2, the most widely accepted mining bit in the industry. But its shorter (1½") stop gives the CC-11 extra rigidity to reduce shank damage when impurities are encountered.

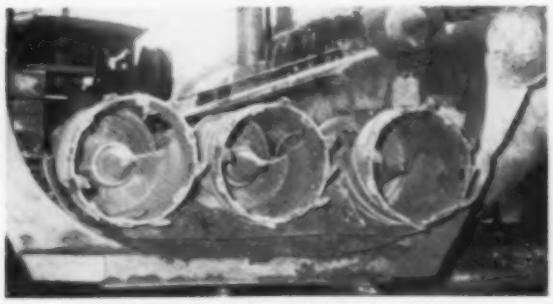
Enclosed in steel, the cylindrical carbide tip in the CC-11 is given positive protection against breakout. It's held firmly in place by a combination of braze and mechanical holding, and positioned to withstand heavy cutting forces. The CC-11 holds up where other designs fail.

New setscrew notch keeps the CC-11 from slipping out of its holder if setscrew should become worn or loosened by vibration. Bit loss is kept to a minimum.

The CC-11, like all bits in the complete line of Carboloy mining tools, is stocked by your local Authorized Carboloy Mining Tool Distributor for immediate delivery. For additional technical information or in-mine assistance call him today. Or write: *Metallurgical Products Department of General Electric Company, 11120 E. 8 Mile Road, Detroit 32, Michigan.*

CARBOLOY®
CEMENTED CARBIDES
GENERAL ELECTRIC

Equipment Developments



COMPTON "TRIPLE HEAD" coal auger.

SCHROEDER "ROOF CAT" roof bolt machine.

The Bluefield Coal Show

OVER 300 ORGANIZATIONS participated in or were represented at the Southern Appalachian Industrial Exhibit at Bluefield, W. Va., May 21-23. Products shown or featured included the following:

LOADING MACHINES

Goodman Mfg. Co., Chicago—High and low loaders.

Jeffrey Mfg. Co., Columbus—81-C and other loaders.

Lee-Norse Co., Charleroi, Pa.—NEW-Model CM37 Lee-Norse miner.

NEW—Model LCM28 Lee-Norse miner.

NEW—Model TJI Lee-Norse mine mechanic jitney.

Long Co., Oak Hill, W. Va.—Long 188D "Pigloader." (*Coal Age*, January, 1958, p 146.)

CONTINUOUS MINERS

Goodman Mfg. Co., Chicago—Goodman miners for varying coal heights.

Ingersoll-Rand Co., New York—NEW—Type 5100 air impact tool for changing bits on continuous miners and coal cutters.

Wilcox Mfg. Co., Raleigh, W. Va.—Continuous miner and extensible chain conveyor.

FACE PREPARATION, CUTTER & DRILL BITS, COAL BREAKING

Black & Decker Co., Towson, Md.—Handheld coal drills.

Cardox Corp., Chicago—Hardsocg underground drilling equipment; cutter and drill bits; airdox coal-breaking equipment.

Duquesne Mine Supply Co., Pittsburgh—"REDipt" set screws for cutting chains.

Hercules Powder Co., Wilmington, Dela.—"King-Size" and regular permissible; standard and delay detonators.

Jeffrey Mfg. Co., Columbus—70-URB and other cutters; cutter bars and chains; handheld hydraulic drills.

Kersey Mfg. Co., Inc., Bluefield—NEW-Self-propelled, rubber tired, low vein cutting machine.

Long Co., Oak Hill, W. Va.—Long 1-19-20 and 1-19-30 hydraulic drills with portable power units (*Coal Age*, January, 1958, p 144).

National Mine Service Co., Pittsburgh—Kennametal bits for all purposes; "Perma-Seal" and "Quick-Seal" tamping plugs.

AUGER MINING

Cardox Corp., Chicago—Cardox AugerMiners for surface and underground use.

Compton, Inc., Clarksburg, W. Va.—"Twin-Head" auger, 24 to 32 in. up to 150 ft deep; "Iron-Ore" low-vein auger.

NEW—"Triple-Head" auger making 18-in cut to depths of up to 200 ft. The triple cutting, the company notes, consistently produce 58 tph of clean, saleable coal from a 24-in seam. Length of the machine is 32 ft; weight, 28 tons; diameter of auger heads, 16 to 22 in each; number of 12½-ft auger sections carried, 30.

Rish Equipment Co., Bluefield—McCarthy coal-recovery drills.

ROOF CONTROL

American Bridge Div., U. S. Steel Corp., Pittsburgh—USS Ambridge bolts, wedge and expansion types, flat, dish and doughnut roof plates.

Bethlehem Steel, Bethlehem, Pa.—Roof bolts.

Chicago Pneumatic Tool Co., New York—Self propelled roof bolting units; stopers; impact tools.

Connors Steel Div., H. K. Porter Co., Huntington, W. Va.—Preassembled West Virginia roof bolts, standard and coneneck; cable hooks for roof-bolt plates.

General Electric-Metallurgical Products Dept.—Roof drill bits.

Ingersoll-Rand Co., New York—"Vacu-jet" dustless stoper and XXLE "Carset" taper bit for use with the stoper; impact wrenches.

Le Roi Div. of Westinghouse Air Brake Co., Cleveland—Stopers, air legs, dust collectors, air drills and drill steel and bits.

Long Co., Oak Hill, W. Va.—Long LRB roof-bolting drill.

Ohio Brass Co., Mansfield, Ohio—Roof-bolting materials.

Pattin Mfg. Co., Marietta, Ohio—Pattin mine roof bolts, wedge and expansion-shell types; plain and embossed steel-plate washers; angle washers.

NEW—Pattin air scaler for sealing and cementing expansion shells in bolting (patented).

Pittsburgh Screw & Bolt Corp., Pittsburgh—"Pit Bolt" high-strength roof bolts.

Schroeder Bros., Pittsburgh—NEW—"Roof Cat" roof botling machine. Special features of the machine are: (1) feed control with new manual sensing of thrust, (2) dust collector optional with either gravity or vacuum type collector, (3) coal drill may be operated from hydraulic circuit, (4) dual tram controls with each crawler independently operated, (5) hydraulic stabilizing jacks (optional), (6) riding platform (optional), (7) micronic return line filter

How a-c distribution and neoprene-jacketed cable give mines an efficiency boost

To mechanize the newly opened O'Donnell No. 2 mine at Sand Fork, West Virginia, the Rochester & Pittsburgh Coal Company installed an a-c electrical system. Neoprene jackets are used on both primary high-voltage cables to the mine load centers and on the 440-volt trailing cables supplying power for machinery. R & P found that this a-c distribution system reduced capital investment for machinery and electrical equipment.

Portable mine load centers can be moved near machinery, minimizing cable length and reducing voltage drop. The system and cable are designed to limit faults to phase-to-ground, providing greater safety for personnel and machinery.

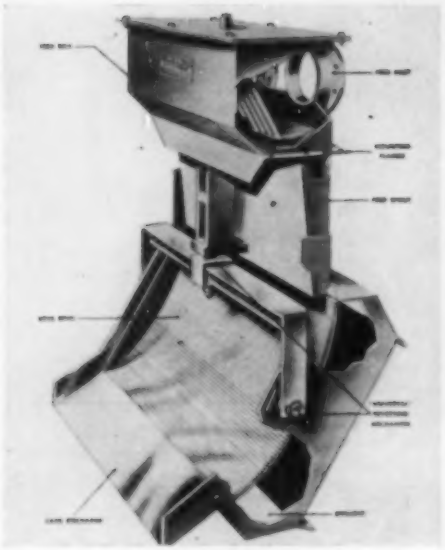
Neoprene jacketing gives extra protection against overheating. Because it is vulcanized, it will not soften at high temperatures. It will not support combustion, and has good resistance to ozone. Neoprene resists oil and grease, acid mine water, abrasion and cutting. Above ground neoprene resists sunlight and weather. It will not become stiff and hard to manage at low temperatures.

When you buy cable, make sure it's jacketed with neoprene. For 15 years, neoprene's combination of properties has paid off in safety and durability for mine operators. For more information about neoprene for cable jacketing and conveyor belts, write for the ELASTOMERS NOTEBOOK to E. I. du Pont de Nemours & Co. (Inc.), Elastomer Chemicals Dept. CO-7, Wilmington 98, Delaware.

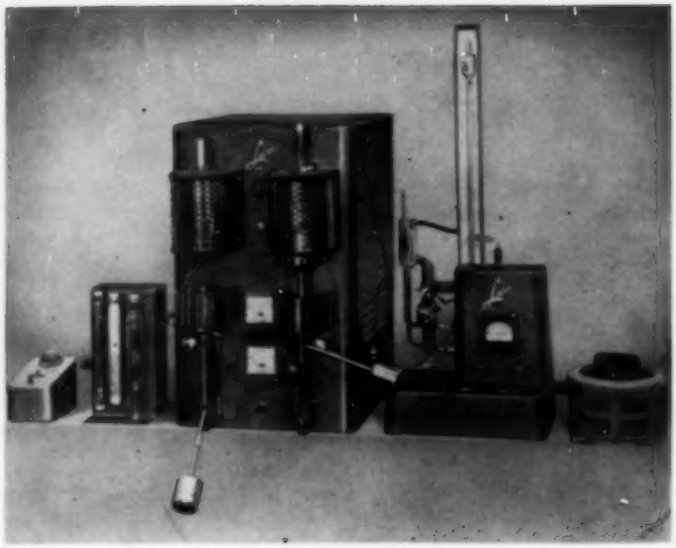
DU PONT

Better Things for Better Living
. . . through Chemistry

NEOPRENE
made by Du Pont
for 26 years



H & P SIEVE BEND.



"LECO" ash and sulfur analyzer.

built into tank, (8) feed length from 28 to 44 in and will reach 40- to 56-in roof, (9) tram speed 175 fpm, (10) machine dimensions are: height 23 in, width 36 in, length 8 ft 6 in, weight 2,700 lb. Dust collectors and filter Spindicators also were shown.

Templeton, Kenly & Co., Broadview, Ill.—Roof and timber jacks.

NEW—Sunplex trip-post jack for greater safety and efficiency in roof-bolt recovery. The company notes that two men using the jack can recover up to 350 bolts per day.

Youngstown Sheet & Tube Co., Youngstown, Ohio—Youngstown VTI roof bolts featuring instant visual indication of bolt tension.

COAL PREPARATION

American Bridge Div., U.S. Steel Corp., Pittsburgh—Cleaning-plant and components fabrication; other structural fabrication.

Armco Drainage & Metal Products, Inc., Middletown, Ohio—Storage bins.

Ashland Oil & Refining Co., Ashland, Ky.—"Permatreat" coal-spray oil.

Barrett, Haentjens & Co., Hazleton, Pa.—Type UN vertical solids-handling pump with no replaceable bearings; Type TS magnetite and heavy-media pump with "Clear Seal"; Type CT heavy-duty high-head refuse pump.

Bixby-Zimmer Engineering Co., Galesburg, Ill.—"BeeZee" coal-screening products.

Centrifugal & Mechanical Industries, Inc., St. Louis, Mo.—Centrifugal driers.

Chicago Pneumatic Tool Co., New York—Air, hydraulic and electric coal drills.

Duquesne Mine Supply Co., Pittsburgh—NEW—"REDipt" car-retarder chain, simple design, high strength.

T. J. Gundlach Machine Co., Div. J. M. J. Industries, Inc., Belleville, Ill.—(Mining Machine Parts, Cleveland), Gundlach crusher.

Guyan Machinery Co., Logan, W. Va.—Wemco solids-handling pump.

Hendrick Mfg. Co., Carbondale, Pa.—Perforated, wedge-slot screens, grating and steel flooring.

Heyl & Patterson, Inc., Pittsburgh; Kanawha Mfg. Co., Charleston, W. Va.—H&P cyclone applications, Reineveld fine-coal dryer, Kanawha plant design and construction.

NEW—H&P "Sieve Bend" screen—A high-capacity clarifying and dewatering unit. Coal slurry is fed tangentially onto a fixed curved deck. Advantages cited for the unit are: efficient classification, effective dewatering, high capacity, ready installation in existing plants, low initial and operation costs, easy maintenance, no motor, no moving parts and no operator.

Industrial Nucleonics Corp., Columbus—"Accuray" systems for tank-level control, determination of pipe-wall thicknesses and the measurement and control of density in heavy-media and flotation circuits.

Keenan Oil Co., Cincinnati—NEW—"Magic-Film Keenoil No. 7 with M. A (molecular automation)" for coal spraying. Described as a highly refined odorless product, it includes seven additives in a lube-oil base for more effective dustproofing, freezeproofing and as a dewatering aid.

Lecco Machinery & Engineering Co., Bluefield—"Lecco Vib" horizontal dewatering screens, inclined sizing screens, vibrating conveyors.

McLanahan & Stone Corp., Holliday, Pa.—Crusher.

Nordberg Mfg. Co., Milwaukee—Symons screens; vibrating rod deck screens; V-screens; horizontal vibrating screens.

B. Preiser Co., Inc., Charleston, W. Va.—Laboratory facilities and equipment, including Precision Scientific and "Labline" general laboratory equipment, Barnstead stills, Christian Becker, Sartorius and Ainsworth balances, International centrifuges, Beckman electronic testing equipment, Robt. Holmes sample-preparation equipment.

NEW—"Leco" high-temperature ash and sulfur analyzer—coal ashing in 10 min, sulfur analysis in 6 min, the manufacturer notes.

NEW—"Leco" automatic A.S.T.M. coal volatile analyzer—high speed, no attention.

Rish Equipment Co., Bluefield—Barber-Greene portable belt conveyors.

Roberts & Schaefer Co., Chicago—Specialist in preparation equipment. Super air-flow cleaner; Hydrotator; Heavy-media; Hydr-separator.

W. L. Roller Co., Philadelphia—Portable prefabricated heavy-media coal cleaners.

Western Machinery Co., San Francisco—Wemco solids-handling pumps.

STRIPPING

Ray C. Call, Inc., Charleston, W. Va.—Koehring shovels.

Cardox Corp., Chicago—Overburden drill bits.

Hercules Powder Co., Wilmington,

B.F.Goodrich

Why miners choose B.F.Goodrich tires

for the really tough jobs!

THE trucks above haul 20 to 25-ton loads out of a Pennsylvania strip mine. Roads are steep, winding and strewn with jagged pieces of rock. These rugged operating conditions once caused tire blowouts, premature failures and sky-high costs. Then the truck operator switched to the tires you see—B.F.Goodrich Rock Service tires. The report: B.F.Goodrich Rock Service tires "take it" so well they can be *retreaded again and again!*

This experience is typical. Miners report longer, trouble-free service and more retreads with B.F.Goodrich Rock Service tires. The B.F.Goodrich FLEX-RITE NYLON cord body withstands double the impact of ordinary cord materials, resists heat blowouts and flex breaks. This Rock Service body outwears even the extra-thick tread, can be retreaded over and over!

Husky Rock Service cleats grip the ground to give positive traction in forward or reverse. Take a tip from miners on the really tough jobs—switch to new B.F.Goodrich Rock Service tires with FLEX-RITE NYLON cord body. See your B.F.Goodrich dealer today—he's listed under Tires in the Yellow Pages of your phone book. *B.F.Goodrich Tire Co., A Division of The B.F.Goodrich Co., Akron 18, Ohio.*

Specify B.F.Goodrich Tubeless or tube-type tires when ordering new equipment

B.F.Goodrich *truck tires*

© The B.F. Goodrich Company

DAILY "SHUTLKAR."

HEWITT-ROBINS "ROPE STRINGER" extensible belt conveyor.

Dela.–Dynatex nitro carbo nitrate blasting agent in various strengths and various types of packages; Hercules Gelamite; blasting caps and detonators; V. A. O. testing meters.

Machinery Inc., Charleston, W. Va. –Gradall shovel; Pettibone-Mulliken power shovel; Reich rotary drill; Schramm rotadrill; multi-purpose power shovel; Bantampower shovel; Pettibone "Speedall 175" shovel.

Rish Equipment Co., Bluefield–Robbins RR10 overburden drill (*Coal Age*, March, 1958, p 152).

Stockdale Mine Supply Co., Frostburg, Md.–Davey M-8A truck-mounted overburden drill.

West Virginia Tractor Equipment Co., Charleston, W. Va.–Michigan tractor shovel; John Deere tractor with angle dozer.

MINE CARS, SHUTTLE CARS MINE LOCOMOTIVES UTILITY CARS

Counts Automotive Supply Co., Bluefield–NEW–Mescher rubber-tired mine tractor (Fred's Welding Service). One of several units by the same manufacturer. Capacity of the tractor is 16 tons trailing load. Tractor weight is 4,000 lb. Power is supplied by a 48-cell Willard "Mine Special" battery.

Goodman Mfg. Co., Chicago–Shuttle cars, mine locomotives.

Jeffrey Mfg. Co., Columbus–66-A and other shuttle cars.

Kersey Mfg. Co., Inc., Bluefield–Models 444, 744, 844, 675 and HT-8 rubber tired mine tractors (2 and 4 wheel drive); Model PC-11 utility truck.

Long Co., Oak Hill, W. Va.–"Inspector's Friend" personnel carrier.

Motor Exchange & Supply Co., Hines, W. Va.–NEW–Daily's Shutlkars in 1½, 2- and 3-ton sizes. With drop bottoms these cars, the builder notes, haul up to 1,500 ft.

National Mine Service Co., Pittsburgh–Types 30 and 48 AC and DC Torkars, Greensburg "Monitor" storage-battery locomotives.

Sanford-Day Iron Works, Knoxville, Tenn.–Automatic dropbottom car for Sandfork (W. Va.) mine of the Rochester & Pittsburgh Coal Co.; 271 cu ft level, 326 cu ft with 6-in topping; 45 in high, 7 ft wide, 17 ft 6¼ in long between coupler centers; Willison automatic couplers; 16-in cast-steel wheels.

MINE CARS & BUSES PERSONNEL FACILITIES

Enterprise Wheel & Car Corp., Bristol, Va.–Mine cars.

Kersey Mfg. Co. Inc., Bluefield–Model PP-9 personnel-utility car.

MINE-CAR FEEDERS, HOISTS, DUMPS

Nolan Co., Bowerston, Ohio–Hydraulic "Porta-feeder" and automatic car loading station.

Sanford-Day Iron Works, Inc., Knoxville, Tenn.–Model HKG hoist-retarder.

W. R. Stamler Corp., Paris, Ky.–Stamler hydraulic car spotter; simplified and improved automatic loading station.

TRACK, TRACK CLEANERS

American Mine Door Co., Canton, Ohio–Canton track cleaners; track switchthrowers for selective or derail service.

Bethlehem Steel Co., Bethlehem, Pa.–Heavy duty track work, including switch material guard rail, frogs, switch stands, steel mine ties and rails.

Connors Steel Div., H. K. Porter Co., Huntington, W. Va.–West Virginia trackwork.

MINE CONVEYORS, BELT, ACCESSORIES

Bearings Inc., Charleston, W. Va.–B & B industrial conveyor rollers.

Boston Woven Hose & Rubber Co., Boston–Boston "Flameout" conveyor belt featuring "balanced construction" and new "Dulon" covers for superior resistance to abrasion, gouging and tearing.

Ensign Electric Co., Huntington, W. Va.–Ensign centrifugal switches.

Flexible Steel Lacing Co., Chicago–Hinged belt fasteners; flexible type fasteners; Rema cold vulcanizing belt repair kits; Nilor belt grip; V-belt fasteners.

General Splice Corp., Beckley, W. Va.–"Minet" hinged belt splices; neoprene pulley lagging.

Goodman Mfg. Co., Chicago–Rope belts.

B. F. Goodrich Co., Akron, Ohio–Conveyor belt.

Goodyear Tire & Rubber Co. (Charleston Electrical Supply Co., Charleston, W. Va.)–Goodyear conveyor belt.

Hewitt-Robins, Stamford, Conn.–NEW –"Rope Stringer" extensible belt conveyor with "Hammock Idlers." The conveyor features are: Easy installation, better operation, provision for relubrication, simple, sturdy construction and maximum safety, states the manufacturer.

Jeffrey Mfg. Co., Columbus, Ohio–Belt and chain conveyors, including 61-AMC conveyor head section.

Long Co., Oak Hill, W. Va.–Long T-16 "Lo-Rope" conveyor. Model HO-20 belt head A-12-P tail section for outside haulage, C8F and SW 12 F conveyor tail pieces, PT 18 "Piggyback" conveyor, M500G portable permissible conveyor power unit, Long chain room conveyors.

National Mine Service Co., Pittsburgh –Scandura "Gold Line" conveyor belt, Hayden belt-fastening equipment, featuring the "Auto-Clip" splicing tool.

H. K. Porter Inc., Quaker Rubber

"A drop in the bucket!" The constructions shown here by Tom Weichel, Okonite's chief mining engineer, are just a random sampling of the cables that Okonite has developed for mining operations. More than likely, Okonite has available right now the exact cable you need—in terms of toughness, flexibility, capacity, resistance to oils, acids, alkalies, mine water and high heat. If not . . . we know how to build it!

Here's how we add value to your cable dollar

Behind these cable constructions are service records that prove the extra long life of Okocord portable cables in the face of continual high-speed reeling, rock falls, run-overs and constant dragging over mine floors and around sharp corners.

Longer cable life means lower operating costs . . . reduction of costly work stoppages . . . greater utilization of expensive equipment. Truly, Okocord represents money in the pocket for any mine operator.

Here's how Okonite assures maximum value for your cable dollar:

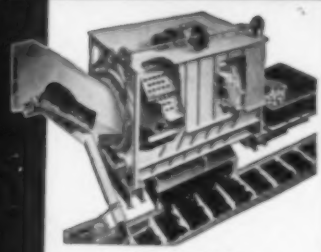
1. By the use of materials developed in 80 years of making the finest cables.
2. By constant research to find even better materials and constructions.
3. By intimate, first-hand knowledge of mining problems and conditions.
4. By self-imposed standards for manufacturing and testing that are more exacting than the industry requires.

There is an Okonite quality cable for your shovels, drills, shuttle cars, continuous miners and other equipment. There are Okonite specialists ready and willing to help you in the planning or installation stages. And there is a brand new booklet full of valuable hints on picking the right cable constructions for your all-important power or control circuits. Write for free Bulletin CA-1117—"How to choose insulated cable"—to The Okonite Co., Passaic, N. J.

***where there's electrical power . . . there's* OKONITE CABLE**

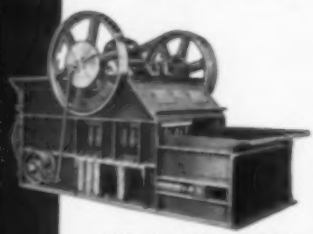
6128

America's most complete line of CRUSHING EQUIPMENT



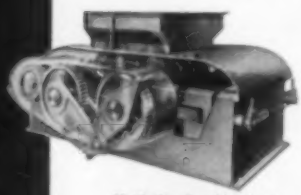
McNally Pittsburg Rotary Breaker

This unit allows positive control of top size in handling run-of-mine washery feed. Production of fines is held to a minimum.



McNally Norton Vertical Pick Breaker

50% Less fines when reducing lump to egg and stove sizes.



McNally Double Roll Gearmatic ROM Breaker

Built in tonnage ranges from 750 tph to 1400 tph. Full floating gearmatic drive.

McNally Gearmatic Stoker Coal Crusher

This unit offers three prime advantages: high volume production, plus accurate sizing, plus low percentage of fines.

McNally Single Roll Crusher

Universal application 20", 24" and 36" diameter rolls.

AVAILABLE

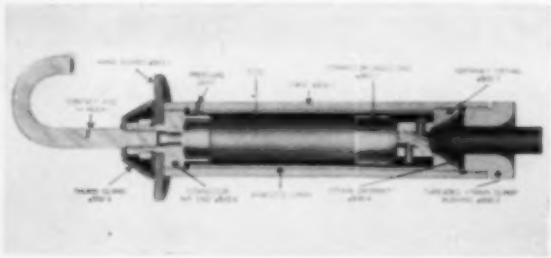
From Stock and on Short Delivery

For immediate action on complete information write, wire, or call.

McNALLY PITTSBURG MFG. CORP.

Pittsburg, Kansas Wellston, Ohio

Bluefield Coal Show (*Continued*)



"ELRECO TRIPLE-GRIP" trolley tap.

Div.—Belts and hose for mining use.

Reid Belt & Rubber Co., Bluefield—Conveyor belt repair; neoprene pulley lagging.

United States Rubber Co., New York—"Mine Haul" conveyor belt, rubber-covered impact and other conveyor idlers.

ELECTRICAL WIRE, CABLE, BONDS, SPLICES, GROUND DETECTORS

American Mine Door Co., Canton, Ohio—"Quick-On" cable splicers, cable vulcanizers.

American Steel & Wire Div., U. S. teel Corp., Pittsburgh—Amerclad mining-machine cables; Tiger Brand electrical wire and cable, including shovel cables.

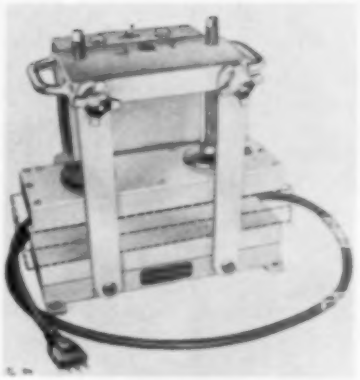
Anaconda Wire & Cable Co., New York—"Securityflex" portable cables; other cables and cords.

Banks-Miller Supply Co., Huntington, W. Va.; **Buchanan-Williamson Supply Co.**, Grundy, Va.; **Williamson Supply Co.**, Pineville, W. Va.—Simplex wire and cable.

Burndy Corp., Norwalk, Conn.—Terminals, splices and connectors.

Circle Wire & Cable Corp., Maspeth, N. Y.—Electrical cables.

Duquesne Mine Supply Co., Pittsburgh—"Dukane" trolley and feeder supports, sectionalizing switches, current collectors, fused trolley taps, fused cable protectors,



JOY ALL-PURPOSE cable vulcanizing press.

plastic utility hooks, slotted-tube stinger hooks.

NEW—"Dukane" plated-steel cable splicers for the bigger cables used on continuous miners.

NEW—"Dukane" extended-pole-head rocker slider—high capacity for the bigger locomotives.

Elreco Corp., Cincinnati—Elreco double-inverted trolley system for rubber-tired vehicles, trolley and feeder materials, sectionalizers for trolley and feeder, insulated "J-Hooks."

NEW—Elreco Form "A" fused triple-grip trolley tap, featuring tellurium copper for increased conductivity and reduced heating; cable-end connector forming the wire into an S-shape for better gripping; positive clamping on all wire sizes from 2/0 to No. 6; neoprene rubber hand and thumb guards; neoprene rubber strain grommet and threaded bushing; asbestos-lined tap body. Ratings are 30 to 400 amp, 600 V maximum.

NEW—Line switch, heavy duty 2,000-amp, substation application.

NEW—Section insulator for aluminum or copper cables, full size range.

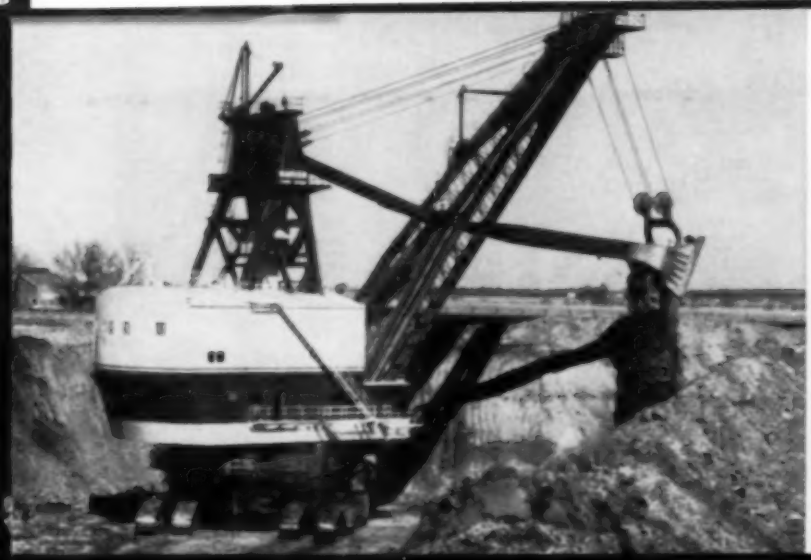
Ensign Electric Co., Huntington, W. Va.—Ensign Ground-I-Cators; cable connectors.

General Cable Corp., Bristol, Tenn.—"Super Service" mining cables.

NEW—"Supertuf" jacket.

Joy Mfg. Co., Pittsburgh—Electrical cable connectors.

NEW—Cable vulcanizing press for operating on seven different voltage



Midland Collieries Inc. Shovel Location – Victoria, Ill.

Peabody Coal Co. Shovel Location – Freeburg, Ill.

Hanna Coal Co. Shovel Location – Cadiz, Ohio

Simco-Peabody Coal Co. Shovel Location – Coshocton, Ohio

WORLD'S LARGEST—The MARION 5760

MARION

POWER SHOVEL COMPANY

MARION, OHIO, U. S. A.

A Division of Universal Marion Corp.

Marion manufacturers a complete line of excavators from ¾ to 75 cubic yards

These Marion 5760s are machines of tremendous proportions and amazing production capacities. With dipper sizes from 60 to 70 yards and boom lengths up to 150 feet, they strip up to 120 feet of overburden and deposit it almost a block away. These giant machines are piling up impressive performance records, month after month, in coal fields. Two of the four have already moved over 2,000,000 cubic yards in a single month.

Consult Marion Mining Specialists for Lowest Costs on Your Property.

Here's How...
to make a
PROFIT
from COAL FINES

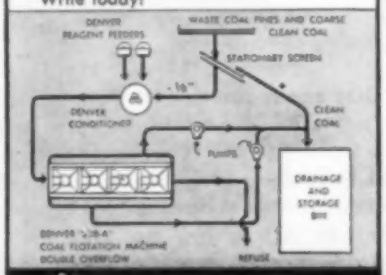
with
DENVER "Sub-A"
COAL FLOTATION

Simple...Low Cost!

You can handle coarse coal (−⅛"x0") at the head of your circuit in DENVER "Sub-A" Flotation Machine. You save coarse as well as fines in a coal product which is easily dewatered! You have simple, low-cost system.

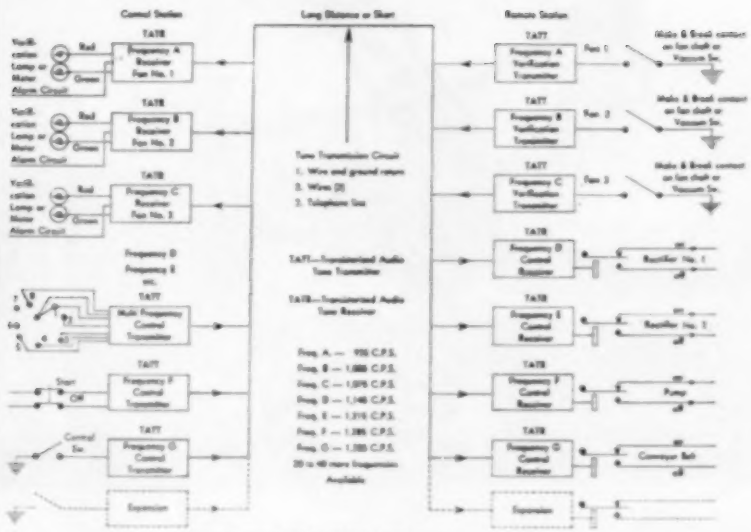
Over 90% of all coal flotation plants in U. S. are Denver "Sub-A", an outstanding testimonial to DECO's experience, engineering "know-how" and equipment.

DECO can provide complete testing, engineering service, flow-sheet design and all equipment for your coal flotation plant. One source of supply, one responsibility. Write today!



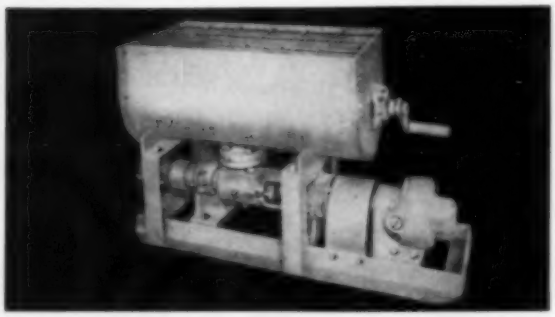
DENVER
EQUIPMENT CO.
1400 Seventeenth St. Denver 17, Colorado

Bluefield Coal Show *(Continued)*



Tone Control and Verification System

M-S-A TRANSISTORIZED remote-control system.



M - S - A SLURRY DUSTER for machine mounting.

ranges develops up to 25 tons pressure on molds and provides 3 kw of heat. Press also includes heat indicating light for each platen, off-on switch for control of power to platen, convenient handles, twin screws to permit even mold closure, and temperature selector for each platen.

Mosebach Electric & Supply Co., Pittsburgh—Trolley and feeder materials, rail bonds, pole heads, harps, current collectors, sectionalizers, cable splicers, cable shock absorbers.

NEW—Bonders.

National Mine Service Co., Pittsburgh—NMS "Ground Sentinel," "Safe Cable" repair service.

Ohio Brass Co., (Charleston Electrical Supply Co., Charleston, W. Va.)—Ohio Brass electrical products, including taps, ground clamps, connectors, feeder and trolley supports, rail bonds, current collectors, sectionalizers, "Magnatrip" circuit interrupters and portable cable-fault locators.

Okonite Co., Passaic, N. J.—Insulated cables, tapes and mine machine cables.

Roebling's Sons, John A., Trenton, N. J.—Electrical wire and cables for mining service.

SAFETY PRODUCTS, MINE LIGHTING, COMMUNICATION

American Mine Door Co., Canton, Ohio—NEW—"Little Chief" hydraulically self-propelled duster for wet or dry rock-dusting, using vane motor on front wheel for travel rate of 2 mph on clean dry road. Hopper capacity is 160 lb. Height is 23½ in; width, 23 in; length, 8 ft; weight, depending on model, 780 to 920 lb.

Duquesne Mine Supply Co., Pittsburgh—"REDipt" S car hold, "Tru-Ring" inspector's roof pick.

NEW—"Dukane" single-flange car sled or skid, single-wheel type with hand hold, made right- or left-hand, special wear-resisting metal; also double flanged.

Femco, Inc., Irwin, Pa.—Loudspeaking telephones (transistorized, battery operated); circuit scanners for fan signal and circuit breaker control systems; "Trolley-phones;" audio amplifiers; station sets.

Guyan Machinery Co., Logan, W. Va.—"Visigard" trolley-wire shielding material.

Mine Safety Appliances Co., Pittsburgh—M-S-A fire truck, methane detecting and recording equipment, respiratory

excavators from ¾ to 7⅝ cubic yards

How Dodge saves you money by matching your truck to your needs

Dodge medium- and heavy-duty trucks have always been built from a wide range of "Job-Rated" components to match a truck exactly to your job. This means that you aren't forced to pay for capacity you don't need, and you don't get undersized units that shorten your truck's life. Just look at the range of components today's line of *Power Giants* offers:

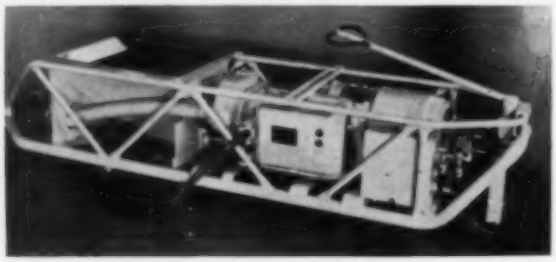
In power, there are Sixes from 125 to 141 hp., Power-Dome V-8's from 204 to 234 hp. Exclusive Power-Dome V-8 design reduces harmful carbon deposits, greatly reducing the need for engine overhauls to maintain maximum power.

In payload, numerous Dodge medium- and heavy-duty models offer G.V.W.'s from 11,000 to 46,000 lbs., G.C.W.'s from 30,000 to 65,000 lbs. in gradual steps. A wide range of "Job-Rated" axles, transmissions, tires, springs and other components makes possible gradual increases in capacity and assures you a dependable, economical truck because it fits your job exactly.

In economy, Dodge provides the thriftiest and most efficient engine and transmission combinations. A range of eight engines and eight transmissions, including automatic Torqmatic, makes this possible. You save on gasoline, too, because Dodge engines operate efficiently on regular gasoline!

Priced competitively throughout the line, in many models Dodge is priced *lowest!* No matter what Dodge *Power Giant* your job calls for, you'll be agreeably surprised at its thrifty price tag. See your Dodge dealer soon, and get his special 40th-Anniversary deal!

DODGE *Power Giants*



LITTLE CHIEF self-propelled rockduster.

STAMLER USERS RE-ORDER TIME AFTER TIME . . .

75.4% of $2,000,000.00 STAMLER Car Spotter SALES have been REPEAT ORDERS!

STAMLER users get the coal out faster . . . more efficiently . . . and at LOWER COST PER TON than they could by any other method. And they know that smooth-working, hydraulic STAMLER equipment operates at a maintenance figure that is negligible. That's why one STAMLER sells another . . . why such a large percentage of STAMLER sales come from companies who already own one or more STAMLER Car Spotters.

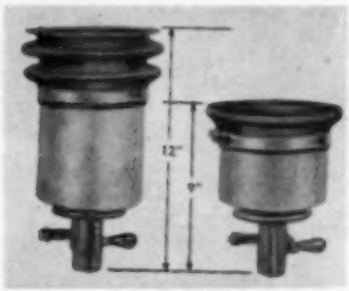
STAMLER Hydraulic CAR SPOTTERS

SCHROEDER BROTHERS, Exclusive Eastern Sales Agent
Pittsburgh, Pennsylvania
UNION INDUSTRIAL CORP., Carlsbad, New Mexico

W. R. STAMLER CORPORATION
PARIS, KENTUCKY

SALMON & CO., Birmingham, Alabama
WESTERN SALES ENGINEERING CO.,
Salt Lake City, Utah

protective equipment, head-to-foot personal protection, first-aid materials and equipment, R-4 cap lamps with NEW constant-potential charging system, Wolf flame safety lamps, McCaa oxygen apparatus with full-view facepiece, M-S-A "MinePhones" and audio communication systems, M-S-A "Drildust" buckets and dust collectors, M-S-A mine lighting systems.



M-S-A SMALL "DRILDUST" bucket compared to large model.

NEW—M-S-A Model 80 slurry rockdust distributor for permanent mounting on any continuous mining machine, loading machine, cutting machine, roof-bolter, coal drill, etc. It is powered either mechanically or hydraulically directly from the machine and has a capacity of 80 lb of dust and 4.8 gal of water, which is loaded in immediately after the cut is finished and agitated by hand for 2 min. The slurry is discharged at a rate of 30 lb per min, and approximately 17 lineal feet of roof and rib can be dusted in 1½ min.

NEW—M-S-A small "Drildust" bucket for lower height workings.

National Mine Service Co., Pittsburgh—Wheat cap lamps and automatic charging facilities (single-, six- and 50-lamp units). NMS first-aid equipment, Willson goggles and respirators, Koehler flame safety lamps, CO_2 indicators, Riken methane indicator, Femco transistorized telephones, "Knee-Eze" knee pads.

W. Va. Tractor & Equipment Co., Charleston, W. Va.—General Electric mobile radios and portable two-way radios.

COMPRESSORS, DRILLS, STEEL & BITS

Acme Machinery Co., Williamson, W. Va.—Stationary compressors, 4-wheel drive; self-propelled air compressor complete with stoper arms, stopers and dust collectors.

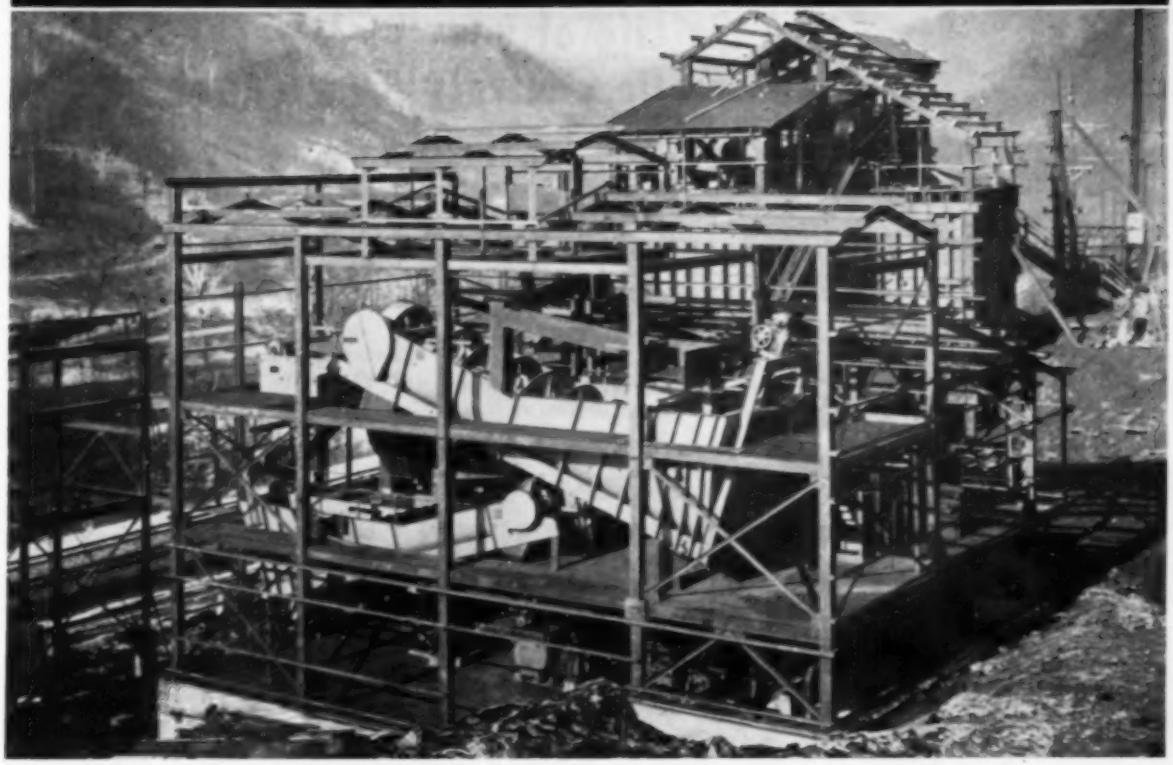
Allegheny, Ludlum Steel Corp., Carmet Div., Brackenridge, Pa.—Cutter, rock and coal bits.

Banks-Miller Supply Co., Huntington, W. Va.; Buchanan-Williamson Supply Co., Grundy, Va.; Williamson Supply Co., Pineville, W. Va.—Ingersoll-Rand drills and drilling accessories.

Ray C. Call, Inc., Charleston, W. Va.—LeRoi "Tractair" compressors.

AKINS SEPARATOR

makes 3-product separation in coal cleaning plant



This coal cleaning plant was designed by the Southwestern Engineering Company. An Akins Heavy Media Separator and Akins Heavy Media Densifier were selected to accomplish a 3-product separation with only one media cleaning circuit. This plant is now operating and fulfilling the job set forth.

PRODUCES 2 GRADES OF COAL

This Akins Separator is making a 3-product separation, requiring only one media circuit. The Akins Separator, permitting extraction and blending of middlings with either float or sink, makes it possible to improve both grade and recovery and produce two types of coal from the same seam...one a high grade for domestic and industrial uses and one a high-ash product for large steam plants.

WRITE FOR AKINS HMS MANUAL 56

PROVED ADVANTAGES OF AKINS SEPARATORS

- 3-product separation in one machine, requiring only one media circuit
- Start-up under full load
- Entire vessel is visible and accessible
- Variation in rate or grade of feed is not detrimental
- Large pool area and volume minimize tramp refuse in the product and facilitate better recovery of values from fine sizes
- Gradation of gravity and viscosity from feed entry point to sink removal point provides natural cleaning of sink, and allows circulation of media at lower gravity and viscosity.

COLORADO IRON WORKS CO.

P. O. Box 9041 • 3800 Race • Denver 16, Colorado

Akins Dewatering Classifiers, Skinner Multiple Hearth Dryers

Sales Agents and Licensed Manufacturers in Foreign Countries

A SUBSIDIARY OF THE MINE & SMELTER SUPPLY CO.

DURAKOOL Tilt Switches are the Life of your Automatic Controls

This steel-clad Durakool mercury tilt switch has unique construction features that deliver years of trouble-free performance on the most difficult assignments you can find. Operating under sealed-in, pressurized hydrogen gas, it takes 24 hours, fast cycling schedules in stride. 7 sizes, 1 to 65 amperes. Send for Bulletin D-49.

MILLIONS OF CYCLES WITHOUT FALTERING

See telephone directory for local distributor, or write.

DURAKOOL, INC.

ELKHART, INDIANA, U.S.A.

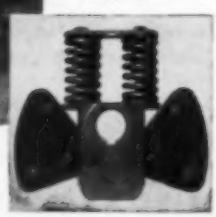
200 WESTON RD., TORONTO 9, CANADA

Durakool ALL-STEEL MERCURY *Switches*

How Link-Belt electrically heated CA vibrating screens achieve

sharp sizing without blinding

SPRING CONTROLLED centrifugal weight type counterweight assembly eliminates excessive resonant motion (bouncing) of the screen while starting and stopping.



FOUR LINK-BELT CA VIBRATING SCREENS size coal at preparation plant of Kentucky mine. Electric screen heater on second unit prevents blinding of cloth when handling fine coal.

The smooth, powerful Concentric Action of Link-Belt CA vibrating screens assures fast, accurate sizing of all kinds of coal. And the Link-Belt electric screen heater prevents plugging and blinding of screen cloth . . . provides top performance when handling fine coal and other hard to screen materials.

One-deck, two-deck and three-deck CA screens are available in sizes from 4 to 6 feet wide by 8 to 14 feet long for a wide range of coal sizes. For additional information, call your nearest Link-Belt office. Or write for Book 2554.

LINK-BELT

VIBRATING SCREENS

LINK-BELT COMPANY: Chicago 9, Birmingham 3, Cleveland 20, Denver 2, Detroit 4, Huntington 9, W. Va., Indianapolis 6, Kansas City 8, Mo., Louisville 2, Pittsburgh 13, Seattle 4, St. Louis 1. To Serve Industry There are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World. 14.077

Bluefield (*Continued*)

Chicago Pneumatic Tool Co., New York—Three-cone air blast rock bits.

Firth Sterling, Inc., Pittsburgh—Cutting machine and carbide drill bits.

Gates Rubber Co., Denver—Gates air hose.

General Electric-Metallurgical Products Dept., Detroit—Roof drill and cutter bits; enclosed cylinder tip machine bits.

Kennametal, Inc., Bedford, Pa.—Jointed auger for roof drilling; rock bits, cutter bits; drill bits.

LeRoi Div. of Westinghouse Air Brake Co., Cleveland—Air drills, drill steel, bits and stopers.

Marathon Coal Bit Co., Montgomery, W. Va.—Drill steel, bits and cutting machine bits.

Rish Equipment Co., Bluefield, W. Va.—Ingersoll-Rand portable "Gyro-Flo" compressors.

Schroeder Bros., Pittsburgh—Compressors.

Timken Roller Bearing Co., Canton, Ohio—Timken tapered rock bits, carbide-insert bits, all-steel multiuse bits.

Vascoloy-Ramet Corp., Waukegan, Ill.—Finger bits, auger drill bits, and roof and cutter bits.

West Virginia Tractor Equipment Co., Charleston, W. Va.—Gardner Denver air compressor, "Air Trac" drill carrier, stopers, drill steel and impact wrenches.

PUMPING & DRAINAGE

Armco Drainage & Metal Products Inc., Middletown, Ohio—Drainage products, including culverts and corrugated-welded and spiral pipe.

Banks-Miller Supply Co., Huntington, W. Va.; Buchanan-Williamson Supply Co., Grundy, Va.; Williamson Supply Co., Pineville, W. Va., Ingersoll-Rand pumps.

Barrett-Haentjens & Co., Hazleton, Pa.—Type PE permissible gathering pump.

Carlon Products Corp., Cleveland—Carlon rigid and flexible plastic pipe.

Charleston Electric Supply Co., Charleston, W. Va.—Allis-Chalmers motor driven pumps.

Chicago Pneumatic Tool Co., New York—Sump pumps.

B. F. Goodrich Co., Akron, Ohio—Hose.

Goodyear Tire & Rubber Co., Akron, Ohio—Hose.

Gorman-Rupp Co., Mansfield, Ohio—Centrifugal mine pumps.

Goyne Pump Co., Ashland, Pa.—Assorted silt disposal pumps.

Guyan Machinery Co., Logan, W. Va.—Foot valves and strainers.

Megator Pumps & Compressors, Inc., Pittsburgh—NEW—Megator sliding shoe pump from Great Britain with exceptional suction powers; some 3,000 reportedly in service abroad.

National Mine Service Co., Pittsburgh—"Alumiron" pipe couplings and fittings.

Established 1872

WILSON MARINE
TRANSIT COMPANY

OWNERS, OPERATORS, AGENTS
WORLD-WIDE BULK CARGO SERVICE

Ship Agents for bulk cargoes to and from any port on the Great Lakes and St. Lawrence River. Coal export enquiries invited.

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USE KELLY REPAIR PARTS!

You can save headaches and money too on repairs to underground machinery by using KELLY parts. They last longer! Fully guaranteed and product insured.

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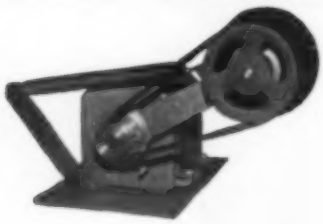
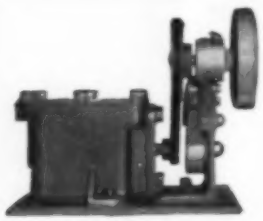
"Watchdog" of your Conveyor System

ENSIGN Centrifugal Switches protect your belt conveyors against fire due to slippage on the pulleys. The switch, when used with a time delay, such as an Agastat, will automatically shut off motor when normal speed of belt conveyor is reduced due to interference.

• • • Saves replacement of expensive belting • • • prevents loss of tonnage due to down time • • • eliminates the hazard of fires • • • provides greater safety to workers • • • can be used for sequence operation of multiple belt system • • • operates forward or reverse direction.



Bulletin 1100
(Dust-tight)



Bulletin 1101
(Explosion-tested)

ENSIGN
ELECTRIC AND MANUFACTURING CO.

914 Adams Avenue Huntington 4, West Va.

Bluefield (*Continued*)

Oster Mfg. Co., Wickliffe, Ohio—Pipe and bolt-threading machines.

Rish Equipment Co., Bluefield—Gorman-Rupp pumps for construction and stripping.

Joseph T. Ryerson & Son, Inc., Cincinnati—Ryertex plastic pipe.

Schroeder Bros., Pittsburgh—Megator M-16 "Snare Pump."

United States Rubber Co., New York—Hose and fittings, including rubber pinch valve hose; rubber and plastic pipe and fittings.

Victaulic Co. of America, Elizabeth, N. J.—Victaulic couplings and full-flow fittings; stainless-steel and "Plastisol" (PVC) lined fittings; "Vic-Groover" tools.

NEW—Polyethylene plastic fittings.

NEW—Roll grooving of plastic tubing for coupling.

VENTILATION

American Mine Door Co., Canton, Ohio—Canton automatic doors.

MOTORS AND CONTROLS, TRANSFORMERS & CONVERSION UNITS BATTERIES

Bluefield Hardware Co., Bluefield—Allis-Chalmers motors and controls, "Economy" renewable fuses.

Counts Automotive Supply Co., Bluefield—Willard batteries, "Magnechargers."

Ensign Electric Co., Huntington, W. Va.—AC and DC magnetic starters; distribution boxes; AC and DC operating coils; Bureau of Mines pushbuttons.

NEW—AC Portable substation rated at 225 KVA and equipped with oil switch, lightning arrestors, current transformers, and dry-type transformers.

General Electric Co., Assemblies and Components, Schenectady, N. Y.—Safety switches, molded-case and inclosed circuit breakers, fuse-puller panels, load denters, Type DH plug-in "Busway."

Gould-National Batteries, Inc., Trenton, N. J.—"Super Dreadnaught" batteries for mine service.

Guyan Machinery Co., Logan, W. Va.—Locomotive and machine resistors; 5- to 25-hp DC autostarters.

Kersey Mfg. Co., Inc., Bluefield—Electric Products Co., Type F-48-1 battery charger; Kersey automatic selenium rectifier battery charger.

Mine Safety Appliances Co., Pittsburgh—NEW—M-S-A transistorized audio tone-control systems for starting, stopping and checking on the operation of circuit breakers, generators, fans, pumps, methane detectors, conveyor belts, etc. The system is designed to use standard-sized "building-block" components which need only be pushed into place in the control center. Up to 30 functions can be controlled with a single pair of wires or one wire and an earth ground.

Post-Glover Electric Co., Cincinnati—P-G reel contactors, steel-grid resistors, manually operated switches, transfer

switches, electrical and pneumatic custom-built assemblies for control applications.

Reliance Electric & Engineering Co., Cleveland—Reliance Super "T" DC motor with explosion-proof enclosure, AC motors with corrosion-proof protected and explosion-proof enclosures; Reeves Pulley Div. of Reliance series 100 motordrives; Master Electric Div. of Reliance, Master Type D Unibrake, fluid drive motor and gearmotors.

Westinghouse Electric Corp., Pittsburgh, Pa.—"Life-Line H" motors, "Oil-Tite" control stations and units, push-buttons.

PLANT LIGHTING, LAMPS

General Electric Co., Lamp Div., Nela Park, Cleveland—"Power Groove" and other fluorescent lamps, mercury reflector lamps.

Westinghouse Electric Corp., Lamp Div., Bloomfield, N. J.—Industrial lamps, including fluorescent and "Colortone" mercury units.

POWER TRANSMISSION

Banks-Miller Supply Co., Huntington, W. Va.; **Buchanan-Williamson Supply Co.**, Grundy, Va.; **Williamson Supply Co.**, Pineville, W. Va.—Diamond roller chains, sprockets, flexible-shaft couplings for power transmission.

B. F. Goodrich Co., Akron, Ohio—V-belts.

Bluefield Hardware Co., Bluefield, W. Va.—Allis-Chalmers "Tex-Rope" drives, Falk reducers.

Charleston Electrical Supply Co., Charleston, W. Va.—Falk reducers, Diamond roller chains and sprockets.

Gates Rubber Co., Denver—Gates "Vulco" V-belts; "Super Vulco" rope drives—lower cost, less weight, low or no absorption or oil, heat resisting, static conducting.

General Electric Co., Apparatus Div., Schenectady, N. Y.—"Tri-Clad 55" gearmotors; other gearmotors for all applications; shaft-mounted speed reducers.

Goodyear Tire & Rubber Co., Akron, Ohio—Compass V-belts; flat transmission belts.

Hart Electric Shop, Bluefield—Browning "V-Drives."

Joseph T. Ryerson & Son, Inc., Cincinnati—Ryertex laminated plastic gears, sprockets.

Kersey Mfg. Co., Inc., Bluefield—Models 57 and 710 speed reducers.

United States Rubber Co., New York—V-belts.

Westinghouse Electric Corp., Pittsburgh "Moduline" gearmotors (*Coal Age*, January, 1958, p 154).

TRACTORS, TRACTOR-LOADERS, BULLDOZERS, GRADERS

Ray C. Call, Inc., Charleston, W. Va.—Euclid TC-12 tractors.

Carter Machinery Co., Roanoke, Va.;

USER REPORTS

"A VERY EFFICIENT CRUSHER; *requires a minimum amount of maintenance.*"

A Midwest Power Plant engineer made this comment and gave the information below about the operation of their American AC 3-E Rolling Ring Coal Crusher.

Total Tonnage Reduced	Over 4,000,000 tons
Feed	20% Nut (3" x 1½") 80% Screenings (1½")
End Product	Minus ½"

Performance reports like this are standard on American Crushers. Each crusher is custom-built to suit your requirements. The American performs as an efficient crusher, producing high tonnage at slow operating speeds — saving power and maintenance. The manganese steel shredder rings are reversible for double life, crushing chambers have renewable liners, and housings are sectional for easy accessibility to rotor, and machined for a dust-tight fit. These, and many other features have been developed throughout 50 years of experience.

Our engineers will analyze your reduction problems and make recommendations of the correct size and type of crusher. No obligation, of course. Write for literature, stating your tonnage requirements.

"When you figure costs—the best results come from American Rolling Ring Coal Crushers"

American PULVERIZER COMPANY
ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS
1119 MACKLIND SAINT LOUIS 10, MISSOURI

In this mine, slate is separated from coal underground and carried on another Quaker conveyor belt to the slate pile.

For fire-safety and ruggedness underground,

SPECIFY QUAKER FIRE-RESISTANT CONVEYOR BELTING U.S.B.M. 28-11

Jagged chunks of coal and slate fall ten feet from the entry belt to this Quaker mother belt in one underground tipple. After 2½ years of constant service, the 2500-foot belt is still as good as new.

Now made especially for underground use where fire-resistance and flame-retardancy are musts, Quaker belting meets U.S. Bureau of Mines Designation U.S.B.M. 28-11 . . . in fact, far exceeds the standards set for it. For example, test flame was extinguished immediately, and afterglow disappeared in one-third the permitted time.

Call your Quaker industrial distributor for the full story, and for valuable assistance on *all* problems involving industrial rubber products.

FREE BELTING CATALOG giving complete information on all standard grades of Quaker conveyor belting. Illustrated. For a copy, write QUAKER RUBBER DIVISION, H. K. PORTER COMPANY, INC.; Philadelphia 24, Pa., or Pittsburg, California.

H. K. PORTER COMPANY, INC.
QUAKER RUBBER DIVISION

Bluefield (*Continued*)

Walker Machinery Co., Charleston, W. Va.—Caterpillar D9 tractor with angle-dozer and rear-mounted hydraulic ripper, D6 tractor with angle-dozer, 955 Traxcavator with side-dump bucket.

Rish Equipment Co., Bluefield—International tractors, Drott "Skid-Shovels," Hough Payloaders.

TRUCKS, ENGINES, TORQUE CONVERTERS, GENERATORS

Ray C. Call, Inc., Charleston, W. Va.—Euclid trucks, front-end loaders; General Motors diesel engines and generator sets.

Carter Machinery Co., Roanoke, Va.; Walker Machinery Co., Charleston, W. Va.—Caterpillar diesel generator sets.

Cummins Engine Co., Columbus, Ind.—Diesel engines.

Dodge Motor Sales—Dodge 400 truck; Dodge 100 Power Wagon.

Machinery Inc., Charleston, W. Va.—Talbert 20-ton trailer.

Mack Trucks, Inc., Plainfield, N. J.—Mack LVX 22½-ton truck with rock-type scoop-end body.

Rish Equipment Co., Bluefield—International Harvester trucks, Hough "Payhaulers," P&H truck cranes, Galion "Grade-O-Matic" graders.

Stowers Motors, Inc., Bluefield—Chevrolet trucks.

Tinder White Truck & Equipment Co., Bluefield; Charleston Truck & Trailer Service Inc., Charleston, W. Va.; White Motor Co., Easton, Pa.—White and Autocar diesel trucks with end-dump bodies.

West Virginia Tractor & Equipment Co., Charleston, W. Va.—Murphy diesel generator.

BEARINGS

Bearings, Inc., Charleston, W. Va.—SKF, Timken, Fafnir, Rollway, Dodge-Timken, MRC, Cooper, Norma—Hoffman and New Departure bearings.

Bearing Service Co., Inc., Pittsburgh—New ball and roller bearings; "Guaranteed" reground bearings.

Bluefield Hardware Co., Bluefield—MRC, Fafnir and Timken bearings.

Coppinger Machinery Service, Bluefield—Federal-Mogul ball and roller bearings and seals.

Joseph T. Ryerson & Son, Inc., Cincinnati—Ryertex laminated plastic bearings.

Timken Roller Bearing Co., Canton, Ohio—Timken tapered roller bearings.

HYDRAULICS

Cross Sales & Engineering Corp., Greensboro, N. C.—Aeroquip flexible hose lines and reusable fittings.

Eastman Atlantic Mfg. Co., Wilmington, Del.—Hydraulic hose assemblies with "pressed on" and "reusable" couplings; wire-braid hydraulic hose; couplings and adapters.

Riggs Engineering Co., Ludlow, Ky.—

Nylaflow pressure tubing for mining.

Ritter Engineering Co., Pittsburgh—Parker hydraulic and fluids-system components, including "No-Skive Hose-Lok" fittings.

Schroeder Bros., Pittsburgh—Hydra Luber; automatic hydraulic shut-off valves; hydraulic circuit tester.

Stratoflex, Inc. (Tri-State Transmission Co., Bluefield)—Detachable reusable fittings and flexible hose assemblies.

Weatherhead Co., Ft. Wayne, Ind.—Hose ends and assemblies; factory-crimped and reusable hose ends, brass- and steel-tube fittings, tube-working tools, industrial hose.

WIRE ROPE, STEEL, STEEL PRODUCTS

American Steel & Wire Div., U. S. Steel Corp., Pittsburgh—Tiger Brand wire rope.

Bethlehem Steel Co., Bethlehem, Pa.—Wire ropes, slings, and industrial fasteners.

Bluefield Hardware Co., Bluefield—Leschen "Red Strand" wire rope.

Circle Wire & Cable Corp., Maspeth, N. Y.—Wire ropes.

Duquesne Mine Supply Co., Pittsburgh—"Black Diamond" swivels and drop links, "REDipt" cap screws and bolts.

NEW—"REDipt" extra-high-strength steel hooks.

Joseph T. Ryerson & Son, Inc., Cincinnati—Ryerson steels, including stainless and alloy, bar, structural, sheets, perforated and expanded metal, tubular products, hot-rolled and cold-finished bars.

Manshach Metal Co., Logan, W. Va.—Lukens steel products.

Pittsburgh Screw & Bolt Co., Pittsburgh—Bolts, nuts and screw products.

Platnick Bros., Bluefield — Structural steel products; design and fabrication of steel structures.

Roebling's Sons, John A., Trenton—Wire ropes and slings.

United States Steel Supply Co., Pittsburgh—T-1, Carilloy "FC" and other USS steels.

West Virginia Steel Corp., Charleston, W. Va.—Structural steel products, steel grating and treads, industrial roofing, translucent structural panels.

LUBRICATION

Ashland Oil & Refining Co., Ashland, Ky.—"Valvoline" and "Aorco" lubricants.

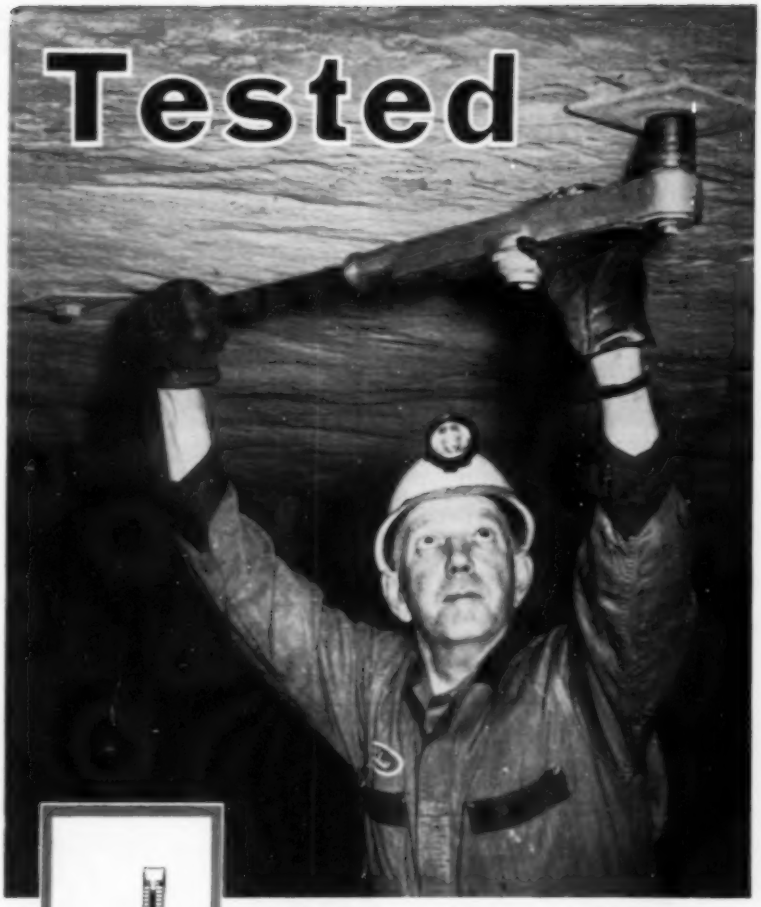
Blue Grass Oil Co.—Socony-Mobil fuels and lubricants.

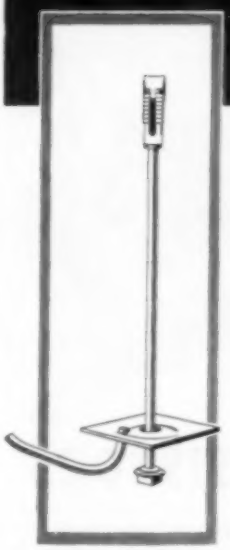
Esso Standard Oil Co., Bluefield—Esso mining lubricants.

Gulf Oil Corp., Pittsburgh—Mining machine lubricants.

Pure Oil Co., New York—Coal-mining lubricants.

Riggs Engineering Co., Ludlow, Ky.—Lincoln Centromatic centralized lubrication systems.





New Dual Slotted Washer Plate, shown here with Suspension Arm inserted. Inquire about this additional service feature!

"West Virginia" Roof Bolts

"West Virginia" expansion units and coneneck bolts, manufactured and assembled by the Connors Steel Division, H. K. Porter Company, Inc., are double tested to meet every AMC standard.

All components are tested to highest quality standards prior to shipment from the plant. In addition, Field Engineers like Chet Plott, shown above testing torque of roof bolts after installation, constantly check these quality bolting products under actual service conditions.

"West Virginia" pre-assembled Roof Bolts can save you appreciable time and money and assure you of the utmost in safety and service. *For details and personalized service,* call on CONNORS STEEL DIVISION, H. K. Porter Company, Inc., P. O. Box 358, Huntington, W. Va. or telephone JAckson 9-7171.

"Service and Quality"

H. K. PORTER COMPANY, INC.

CONNORS STEEL DIVISION

TRIAL SAMPLES

Of World-Famous WHITMORE'S Lubricants NOW IN AEROSOL SPRAY-ON CANS!

HANDI-LUBE LIQUID GEAR COMPOSITION

For open gears, sliding surfaces—exclusive formulas eliminate metal to metal contact, keep wear on the lubricant not the metal—no breakdown even after prolonged use under water—available for every climatic condition—packaged in handy 16-oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

WIRE ROPE SPRAY LUBRICANT

Exclusive formulas for lubricating and protecting wire rope, chain, springs. Penetrates to the core of wire rope minimizing internal friction and increasing usable life up to 300%—special protective qualities absolutely eliminate corrosion—non-gumming qualities reduce "carry-back"—packaged in handy 16 oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

65 YEARS OF LEADERSHIP LUBRICATING THE FOLLOWING:

- Open Gears, Dipper Sticks, Cams
- Enclosed Gear Cases
- Wire Rope and Cable
- Hydraulic Units, Torque Converters
- Roller, Ball, and Sleeve Bearings
- Speed Reducers

Est. 1893

THE WHITMORE MANUFACTURING CO.

LUBRICATING ENGINEERS

CLEVELAND 4, OHIO, U.S.A. PHONE: VULCAN 3-7272

For LOADERS and CUTTING MACHINES

Guyan SUPER RESISTORS

THE TREND toward super power and super capacity in machinery calls for SUPER RESISTORS to keep breakdowns at a minimum.

The GUYAN design takes full advantage of the space available in the resistor compartment to build a resistor of proper electrical resistance and high current capacity. The terminals are of heavy cast bronze, clamp type for rigid connections. And they are easily accessible and plainly stamped corresponding to the terminal markings on the original wiring diagram.

Available for all popular types of mining machines and loaders. No alterations necessary. Resistors are designed to fit original pockets of the machines. Write for complete information.

GUYAN MACHINERY CO.
LOGAN, W. VA.

Guyan
RESISTORS

Bluefield *(Continued)*

Ritter Engineering Co., Pittsburgh—Trabon centralized lubricating systems, including "Multizone" types.

Texas Co., New York—Lubricants and engineering service.

GOODMAN ALUMINUM sealed-beam headlight.

NEW & RENEWAL PARTS

Bearings, Inc., Charleston, W. Va.—Nylon bars, tubular bars, tubing and gears.

Bertrand P. Tracy, Pittsburgh—Mining machine parts.

Coppinger Machinery Service, Bluefield—Replacement parts.

Fairmont Supply Co., Bluefield—Representing 228 manufacturers of equipment and supplies.

Goodman Mfg. Co., Chicago—NEW—Type AL aluminum sealed-beam headlights; weight less than 10 lb; explosion and weatherproof; size 6x6x7¼ in; suitable for all types of mining machinery.

Guyan Machinery Co., Logan, W. Va.—Locomotive and machine headlights.

Hart Electric Shop., Bluefield—Armature and field coils.

Huntington Supply & Equipment Co., Huntington, W. Va.—Renewal parts. Representing Cincinnati Mine Machinery Co., Tool Steel Gear & Pinion Co., Nolan Co., ABC Scale Div., McDowell Co., Inc.

Jeffrey Mfg. Co., Columbus—Mechanical and electrical renewal parts, including controllers, starters, headlights, resistors, transfer switches, bearings, etc.

Joy Mfg. Co., Pittsburgh—"Genuine" Joy replacement parts.

Marathon Coal Bit Co., Montgomery, W. Va.—Mine machinery replacement parts.

Mining Machine Parts, Cleveland—Renewal parts.

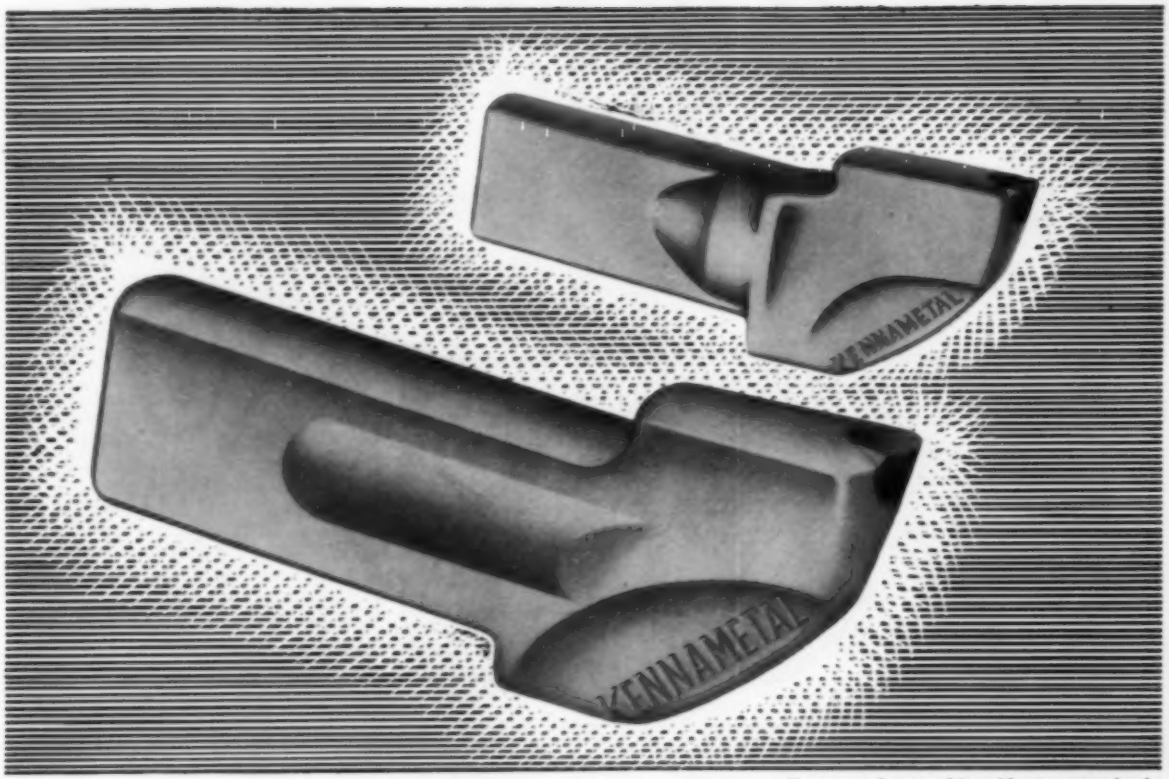
Mosebach Electric & Supply Co., Pittsburgh—Brass bushings.

National Electric Coil Co., Columbus—National coils—armature, field, etc.

National Mine Service Co., Pittsburgh—Clarkson "Red Bird" conveyor chain.

National Parts, Inc., Bluefield—Crankshafts, camshafts, bearings and universal joints.

Ohio Carbon Co., Cleveland—Brushes



Kennametal cutter bits with stronger shanks for today's higher powered mining machines.

Next time the going gets rough...

Try these two NEW Kennametal* Cutter Bits

Using standard bit blocks, the new U7B Series, shown in the foreground above, quickly and economically reduces shank breakage in hard cutting sections. Reinforcing ribs on both sides of the shank fit the center hole of most bit block designs and provide the added shank strength required to resist side thrust.

Kennametal offers the rugged U3 Series for *extreme* cutting conditions, where hard impurities are encountered frequently and maximum bit strength is required. Special Bit Blocks to fit the U3's greatly increased cross sectional area are now available.

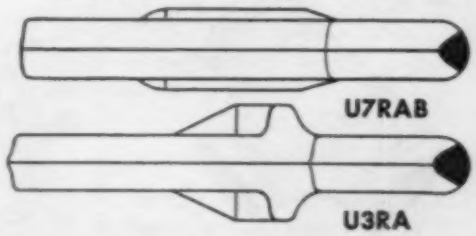
Actual mine testing, in problem areas, has proved that both of these bits keep cutting coal where other bits fail.

Forged from highest quality steel, the added shank cross section provides the strength required to stand up in difficult cutting areas under the high power of today's mining machines.

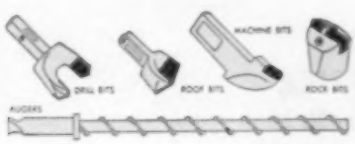
Get more information on the latest of "The Yellow Bits" from your Kennametal Representative. You'll find his name listed in the Classified Section of your Telephone Directory under "Mining," or write KENNAMETAL INC., Mining Tool Division, Bedford, Pennsylvania. 8158

*Trademark

Increased cross section provides increased strength



2 GOOD TIPS—Both Kennametal U3 and U7B Bits are available with these popular tips.



INDUSTRY AND
KENNAMETAL
...Partners in Progress

VICTAULIC®

METHOD OF PIPING

VICTAULIC HAS EVERYTHING...

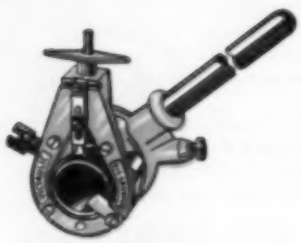
VICTAULIC COUPLINGS
Simple, fast, reliable. *Styles 77, 77-D,* for standard uses with steel or spiral pipe, — *Style 75* for light duty. Other styles for cast iron, plastic and other pipes. Sizes ¾" to 60".

ROUST-A-BOUT COUPLINGS
For plain or beveled end pipe *Style 99.* Simple, quick, and strong. Best engineered and most useful plain end coupling made — takes a real "bull-dog" grip on the pipe. Sizes 2" to 12".

VICTAULIC SNAP-JOINTS
The new, boltless, speed coupling, *Style 78.* Hinged into one assembly for fast piping hook-up or disassembly. Hand locks for savings in time and money. Ideal for portable lines. Sizes 1" to 8".

COUPLINGS FOR EVERY PIPING JOB

VICTAULIC FULL-FLOW FITTINGS
Elbows, Tees, Reducers, Laterals, a *complete line*—fit all Victaulic Couplings. Easily installed — top efficiency. Sizes ¾" to 12".



VIC-GROOVER TOOLS
Time saving, on-the-job grooving tools. Light weight, easy to handle — operate manually or from any power drive. Sizes ¾" to 8".

PLUS FITTINGS AND GROOVING TOOLS

"EASIEST WAY TO MAKE ENDS MEET"

Promptly available from distributor stocks coast to coast.
Write for NEW Victaulic Catalog-Manual No. A-7

VICTAULIC COMPANY OF AMERICA
P. O. BOX 509 • Elizabeth, N. J.

Bluefield *(Continued)*

for motors and generators; Karak carbon for mechanical and electrical applications.

Westinghouse Electrical Corp., Pittsburgh—Headlights.

W. Va. Armature Co., Bluefield—Field coils, armature coils, mechanical parts for mine equipment.

MAINTENANCE, REPAIR SERVICE

Allegheny Ludlum Steel Corp., Carmet Div., Brackenridge, Pa.—Industrial tools, metal-cutting tools, carbide blanks.

Bearings, Inc., Charleston, W. Va.—OTC tools and pullers.

Bird & Son, Inc., Walpole, Mass.—"Wind Seal" and "Master-Bilt" shingles.

Black & Decker Co., Towson, Md.—Production and maintenance power tools of all types.

Blackhawk Mfg. Co., Milwaukee, Wis.—Blackhawk hydraulic tools, including hand jacks, "Porto-Power" jacks, and "Porto-Power" hand pumps, motor pumps, rams, attachments and maintenance assortments, pipe benders, knockout punches, presses, gages, valves and fittings.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.—Paints and coatings, including safety color-coded paints.

Guyan Machinery Co., Logan, W. Va.—Guyan repair service.

Hart Electric Shop, Bluefield—Armature and motor repair and rewinding; precision machine work; also General Electric and Delco-Packard products.

Ingersoll-Rand Co., New York—I-R power and impact tools.

Machinery, Inc., Charleston, W. Va.—Thread-repair tools, power hoists.

Mosebach Electric & Supple Co., Pittsburgh—NEW—Resistance welders.

National Electric Coil Co., Columbus—Armature and coil rewinding and rebuilding service with various insulations.

National Mine Service Co., Pittsburgh—"Real-Dri" moisture-absorbing units for control compartments; hydraulic pump rebuilding; equipment rebuilding.

Pocahontas Welding Supply Co., Bluefield—Hobart welding machines and accessories; Bay State cutting bits and abrasive wheels; alloy rods; oxygen therapy units.

Post-Glover Electric Co., Cincinnati—P-G arc welders and electric heaters.

Rish Equipment Co., Bluefield—Malsbury steam cleaners.

Rust-Oleum Corp., Evanston, Ill.—Rust preventive paints and coatings.

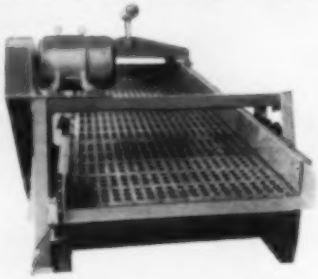
Sherwin-Williams Co., Cleveland—Aluminum maintenance paints; protective coatings, including "Metalastic" graphite products; "Fast Dri" synthetic and "Kem-Lustral" all-purpose enamels, "SWP," "Kemtone" and "Kemglo" paints.

Skil Corp., Chicago—Skil portable tools, including drills and saws.

S. K. Wellman, Inc., Bedford, Ohio—

Industry
NEEDS DEPENDABLE
NOURISHMENT too!
Take a tip from your family's dependence on "nature's most nearly perfect food". Coal is nature's most nearly perfect fuel. It's here in abundance for ages to come, a dependably low-cost and most efficient source of "go power"! It's convenient too —right on Industry's doorstep.
B&O
BITUMINOUS COALS FOR EVERY PURPOSE
Ask our man! BALTIMORE & OHIO RAILROAD, BALTIMORE 1, MD., Phone: LExington 9-0400

HENDRICK H QUALITY STEEL PLATE SCREENS COAL MORE ECONOMICALLY



Tough and rugged Hendrick H Quality Steel Perforated Plate lasts longer, even under continuous and heavy-duty use, because it is made from heat-treated high-carbon steel. It screens coal easier and faster, while the full clearance of its perforation reduces downtime costs due to blinding. Product uniformity is assured throughout the life of the screen. For all these reasons, Hendrick H Quality Steel Plate can make the difference between profit and loss in coal preparation. Order Hendrick H Quality Steel with either flat, corrugated, or stepped surfaces, in any desired shape and with any size of perforation. Whatever you order, you get Perforated Plate which reflects Hendrick's 82 years of experience in selecting the steel the mining industry needs.

Hendrick

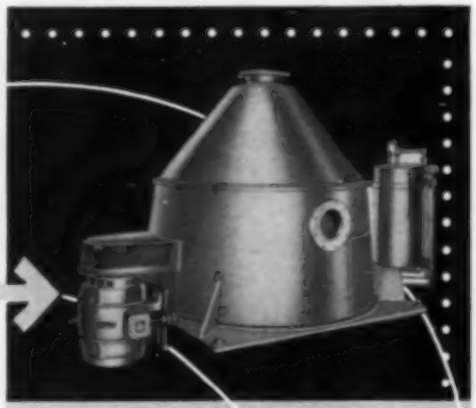
MANUFACTURING COMPANY

41 DUNDAFF STREET — CARBONDALE, PA.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens
Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads
Armogrids • Hydro Dehazers • Distillation Column Internals

CMI

THE BEST COAL DRYER



CMI Continuous Centrifugal Dryer

Reduces 35% surface moisture in coal to less than 5%, at the rate of 75 tons or more per hour. CMI Dryers enjoy a matchless and proved performance record wherever coal is mined. CMI Dryers have been built and constantly improved since 1922.

CMI Brochure No. EB-36 gives complete details. Write for it, please.

CMI CENTRIFUGAL AND MECHANICAL INDUSTRIES
INCORPORATED
146 President Street • St. Louis 18, Missouri

Bluefield (*Continued*)

Automotive friction products, including clutch plates, facings and brake linings.

Smith Welding Equipment Co., Minneapolis, Minn.—Welding and cutting equipment.

Southern Oxygen Co., Bluefield—Victor welding and cutting equipment and hardfacing rods, Miller welding machines, Southern gases, electrodes.

Templeton, Kenly & Co., Broadview, Ill.—Center-hole jennies; journal, ratchet-lowering and track jacks; "Util-a-Trol" tools; "Re-Mo-Trol" jacks and pullers; push-pull and two- and three-grip pullers.

NEW—100- and 150-ton hydraulic rams with power pumps.

Toledo Pipe Threading Machine Co., Toledo, Ohio—Pipe threading machines and tools.

W. Va. Armature Co., Bluefield—Electrical and mechanical repair service at five coal-field shops in West Virginia and Kentucky.

MINING SPECIALTIES, SERVICES

Appalachian Electric Power Co.—"Coal by wire home heating" and cooling.

Armco Drainage & Metal Products, Inc., Middletown, Ohio—Steel buildings, tunnel and shaft liner plates.

Bluefield Supply Co., Bluefield—Representing American Steel & Wire Div., U. S. Steel Corp.; American Blower and Kewanee Divs., Standard Radiator & Sanitary Corp.; Boston Woven Hose & Rubber Co.; Burndy Corp.; E. I. du Pont de Nemours & Co., Inc.; Gates Rubber Co.; General Electric Metallurgical Products, Apparatus, Assemblies & Components and Lamp Divs.; Gorman-Rupp Co.; Ingersoll-Rand Co.; Iron Fireman Mfg. Corp.; Malsbary Mfg. Co.; Marion Handle Mills; Mosebach Electric & Supply Co.; Ohio Carbon Co.; Connors Steel Div., H. K. Porter Co.; Skil Corp.; Smith Welding Equipment Co.; Stratoflex, Inc.; Victualic Co. of America; Youngstown Sheet & Tube Co.

Coal Age, New York—Publishing services for the coal industry, including those of its affiliates, **Keystone Coal Buyers Manual** and **Coal Mine Directory**.

Iron Fireman Mfg. Co., Portland, Ore.—Stokers.

Marchant Calculators, Inc., Oakland, Calif.—Calculators and business machines.

Marion Handle Mills, Inc., Marion, W. Va.—Hickory tool handles of all types.

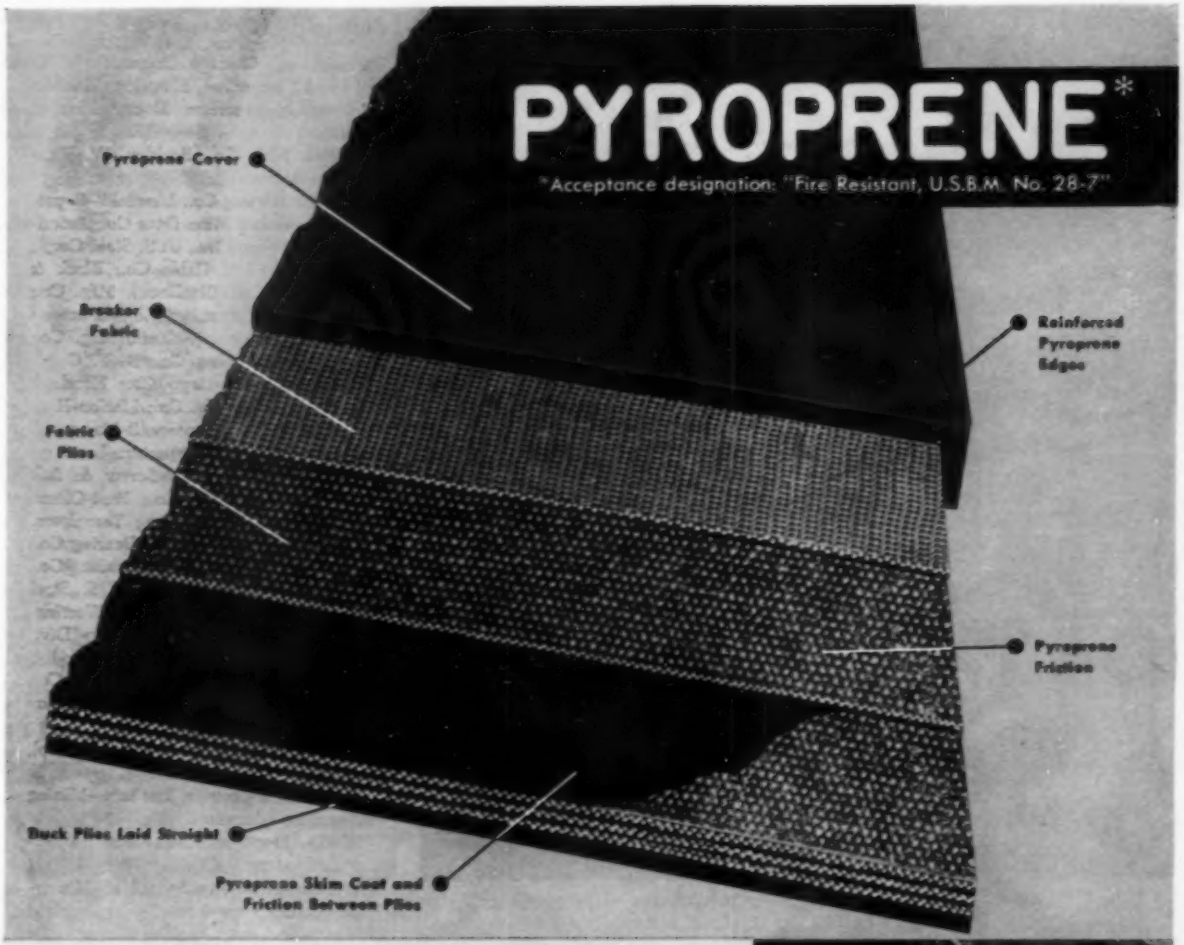
Mechanization, Inc., Washington, D. C.—Coal mining and utilization publications.

Mercer County Vocational Schools—Vocational training for industry.

National Coal Association, Washington, D. C.—Industry services.

Norfolk & Western Railway Co.—Class H-10 70-ton hopper car; Class C-3 caboose; 50-ft box car; safety car.

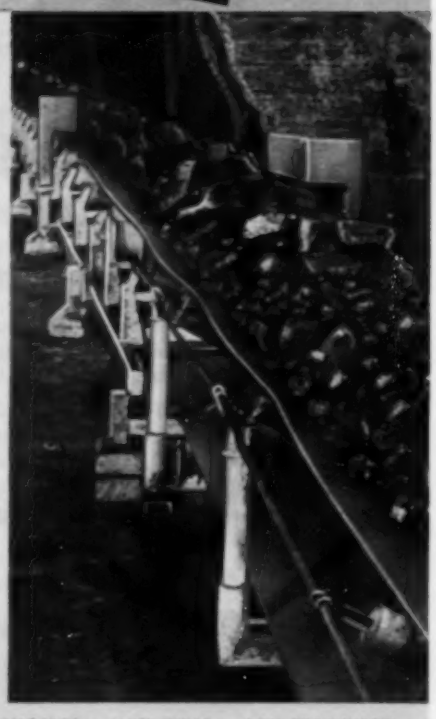
Persinger Supply Co., Charleston, W. Va.—Whitney and Jeffrey mining chains,



What happens if fire penetrates to the carcass of a conveyor belt?

It goes out if it's a Hamilton Pyroprene belt. Fire just can't find fuel to feed on in this U.S.B.M.-accepted belt because every element is "Pyroprene Protected". The cover is all Pyroprene. The fabric plies and the breaker fabric are completely encased with 100% Pyroprene compound before the belt is built.

In addition to fire resistance, Pyroprene belting offers exceptional durability and strength. The cover will give maximum resistance to cuts, tears, gouging and abrasion; reinforced edges protect carcass at critical wear point. Breaker fabric acts as cushion for impact. Fabric plies are strength members. Skim coats increase adhesion and prevent ply separation. Write Dept. MI-105.



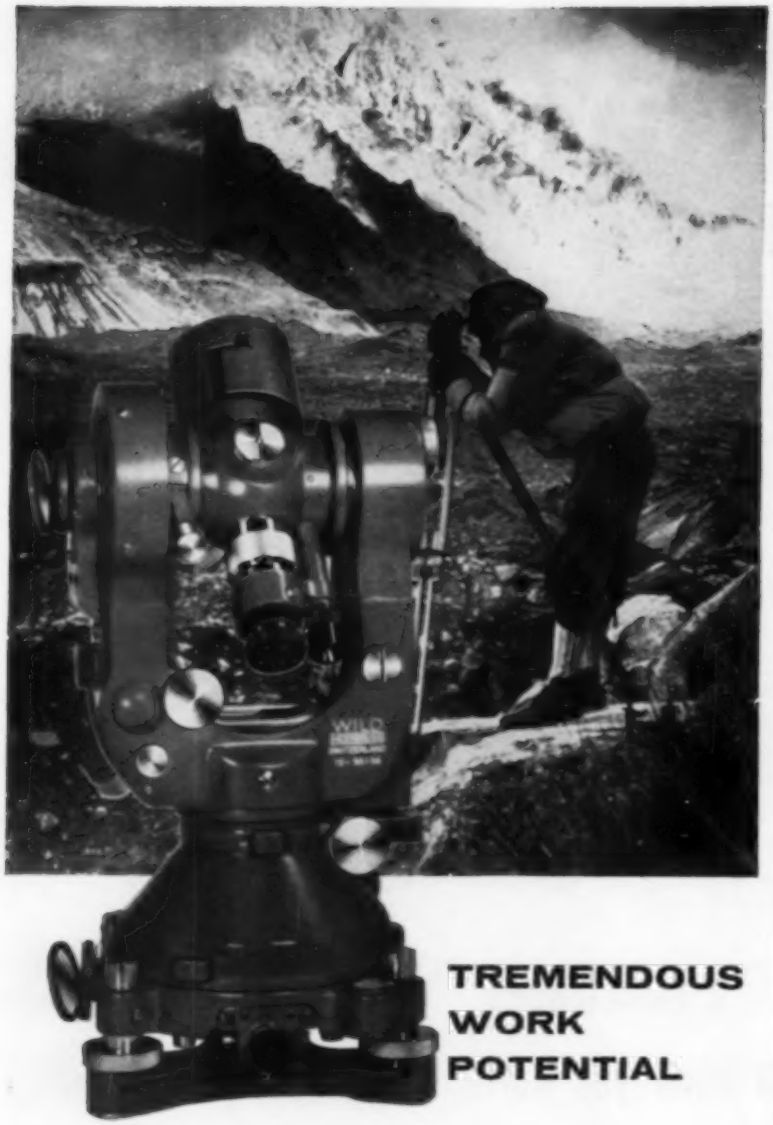
Serving Industry since 1870

Hamilton Rubber

MANUFACTURING CORPORATION, TRENTON 3, N. J.

A Division of Acme-Hamilton Manufacturing Corporation

ATLANTA • CHICAGO • HOUSTON • PITTSBURGH • INDIANAPOLIS • LOS ANGELES • NEW YORK • SAN FRANCISCO



TREMENDOUS WORK POTENTIAL

T-2 UNIVERSAL THEODOLITE

The Wild T-2 enables the operator to work rapidly, precisely and steadily under conditions that may range from equatorial to antarctic.

Optical and mechanical excellence, plus negligible maintenance requirements, combine with a complete list of accessories to make the T-2 the finest instrument in its class by far.

Write or phone for Booklet T-2 for complete data.

Full Factory Services

WILD HEERBRUGG INSTRUMENTS, INC.

MAIN AT COVERT STREET, PORT WASHINGTON, NEW YORK • PORT WASHINGTON 7-4843

Bluefield (*Continued*)

Carmet bits, Chicago Pneumatic drills and impact wrenches, Simplicity double-deck vibrating screen, Dodge Paraflex couplings.

Raleigh Junk Co., Beckley, W. Va.—Scrap metals.

Superior-Sterling Co., Bluefield—Representing American Mine Door Co.; American Steel & Wire Div., U. S. Steel Corp.; Anaconda Wire & Cable Co.; Black & Decker Mfg. Co.; Blackhawk Mfg. Co.; Burndy Corp.; Deming Co.; Diamond Chain Co.; Eastman Atlantic Mfg. Co.; Flexible Steel Lacing Co.; B. F. Goodrich Co.; Gorman-Rupp Co.; Hendrick Mfg. Co.; Jeffrey Mfg. Co.; Marion Handle Mills, Inc.; Minneapolis-Honeywell Regulator Co.; New Departure bearings; Okonite Co.; Pittsburgh Screw & Bolt Corp.; Reeves Pulley Co.; Rust-Oleum Corp.; SKF Industries, Inc.; Templeton, Kenly & Co.; Timken Roller Bearing Co.; Toledo Pipe Threading Machine Co.; United States Supply Div., U. S. Steel Corp.; Western Machinery Co.; Westinghouse Electric Corp. and Lamp Div.; Youngstown Sheet & Tube Co.

Technical Reproduction & Supply Co., Huntington, W. Va.—Keuffel & Esser surveying equipment.

U. S. Bureau of Mines—Roof control, health and safety services.

Virginia Polytechnic Institute—Mining engineering education.

W. Va. Dept. of Mines—Mine inspection and safety.

W. Va. University School of Mines—Mine extension services.

TIRES

Reid-Boyce Tire & Tread Co., Bluefield—General truck and industrial tires.

Free Bulletins

CONCRETE ADDITIVES—An 8-p general catalog, 5-Si, published by Sika Chemical Corp., 29-49 Gregory Ave., Passaic, N. J., describes chemical products for controlling setting time, joint sealers, caulking and so on and presents typical problems and solutions in concrete work.

BULLDOZERS—Caterpillar Tractor Co., Peoria, Ill., announces availability of Form No. 33178 which describes 4 yr of improvements on the D-8 tractor, and Form No. D817 which describes the makeup and maintenance of track rollers.

SCREENS—A 22-p catalog offered by W. S. Tyler Co., Cleveland 14, Ohio, shows models, operating principles, applications, specifications and optional equipment for the company's full line of Ty-Rock screens. Also included is an outline of

screen-problem data which should be submitted in inquiries to the manufacturer.

TWO-WAY RADIO—General Electric Communication Products Dept., Syracuse, N. Y., has issued Bulletin ECR 566A on GE's new portable two-way radio with completely transistorized receiver, which explains sensitivity, design, audibility, standby drain and field servicing.

ROPE-BELT CONVEYOR—Latest design of the Joy Limberope conveyor system is explained in new 2-p Bulletin GG-6C. Liberoller idlers are swivel-mounted to rigid cradle brackets for greater flexibility and load conformity while keeping wire-rope support stringers parallel. Write Joy Mfg. Co., Henry W. Oliver Bldg., Pittsburgh 22, Pa.

VIBRATING SCREENS—Design and construction features of "Low Head" horizontal vibrating screens are described in Bulletin 07B6330B, now available from Allis-Chalmers, Milwaukee 1, Wis. The bulletin diagrams installations in floor mountings and cable suspensions with tables on sizes and dimensions. Custom built screens and screen accessories are included in the 24-p booklet.

3-YD SHOVEL—Koehring 1205 shovel is the subject of a 24-p catalog which deals with features such as operating stability, power flow, positive-traction steering and exclusive "feel of the load" power clutches. A weight chart and disassembly instructions are included in the booklet. Write Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis.

STORY OF WOOD — "The Wonder Wood," a 16-mm sound and color film, running time 21 min, is available from Joseph Bray, Osmose Wood Preserving Co. of America, Inc., 980 Ellicott St., Buffalo 9, N. Y. The film deals with the qualities of wood, its few weak points and how they are eliminated, and the story of pressure wood preservation.

PRECIPITATOR—Bulletin 276 includes drawings, dimensions and arrangements of the AAf Skimmer, a centrifugal dust precipitator made by American Air Filter Co., Inc., 215 Central Ave., Louisville, Ky. This is a medium-efficiency, low-pressure-drop unit used for primary dust collection in pneumatic conveying and in reclamation of the large size fraction of dust in the dry state. The bulletin is free.

DRILLING TOOLS—Blasthole drilling tools are the subject of a 12-p bulletin prepared by Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill. Included are detailed specifications on the complete line of carbide drill bits, drill steel, couplings, adapters, extension steel and so on, plus applications of the various tools.

WIRE ROPE—"How To Be A Wire Rope Expert," is the title of a 16-p illustrated booklet offered by Leschen Wire Rope Div., H. K. Porter Co., Inc., 2727 Hamilton Ave., St. Louis 12, Mo. It describes in easily understandable language the basic principles of selecting wire rope constructions for any job.

CYCLONES—Brochure 1157 contains tables and graphs giving performance data on all models of H&P cyclones. Also included are exploded views of cyclones and examples of field installations. Available from Heyl & Patterson, Inc., 55 Fort Pitt Blvd., Pittsburgh 22, Pa.

POWER CABLE—Hints for buyers on selecting proper cable construction feature the new 20-p booklet "How to Choose Insulated Cable," just released by the Okonite Co., Passaic, N. J. The booklet contains a checklist of technical points to be covered in specifying an electrical cable circuit. Ask for Bulletin 1117.

BELT FAILURES?
Switch to
NEW YORK RUBBER!

New York Rubber, famous since 1851, manufactures belt designed to meet trouble—and overcome it! Built for the most severe service demands, there's a New York Rubber belt designed to solve *your* problem. Mineral mining, quarrying, coal mining—these activities often require a belt that will show superior resistance to sharp and abrasive materials, frequently in the presence of oil and grease conditions. Fire, too, takes its toll of conventional belts.

That's why it will pay you to investigate New York Rubber. A brief description of four of our most popular belts follows. Write on your letterhead for more complete details on these and other superior New York Rubber Belts.

REDUCE FAILURES
with these New York Rubber belts:

STONORE—Highest quality, for most severe service. Handles heavy ores, trap rock, crushed stone, coarse broken glass, slag, cement clinkers, direct feed from digging and mining machinery. Mildew-proof.

DEPENDABLE—For handling coal both under and above ground, sand and gravel, trap rock, sulphur, lime and limestone. Ideal for sub-zero temperatures. Mildew-proof.

NEOPRENE—Resists oil and grease conditions adverse to natural rubber. Handles caustics and coal briquettes. Heat-resistant to 250°F. Mildew-proof.

TEMP-PRENE*—A neoprene compounded for fire resistance and severe, rough surfaces. Mildew-proof.

*Acceptance designation: "Fire Resistant, U.S.B.M. No. 28-11".

NY RUBBER
NEW YORK RUBBER
CORPORATION
Established 1851
100 PARK AVENUE • NEW YORK 17, NEW YORK

Among the Manufacturers

Keyword: Continuity

E. M. Arentzen, president, Lee-Norse Co., Charleroi, Pa., announces that management of the company has decided to continue the present Lee-Norse setup in business as an independent manufacturer of mining machinery.

During the past year several plans had been considered to enlarge the company's facilities to better serve the coal industry. Some of these plans included negotiations with other large mining-machinery manufacturers for possible merger or affiliation.

The Lee-Norse Co., since its founding in 1940, has developed coal-mining machinery and equipment for underground mining which has been well received by the coal industry. Recent successes with the Lee-Norse Miner are well known to operating men, Mr. Arentzen said. The new Model CM-37 Lee-Norse Miner, introduced earlier this year, has been improved by the addition of approximately 25% in weight over previous models, and the installation of larger motors and additional strength where it was needed. The machine is now produced for both 250 and 500 V, DC, as well as AC applications. The company is going into production of Model LCM-28 "Low Coal" Lee-Norse Miners, which are suitable for mining in seams from 30 to 48 in thick. The company plans to enlarge manufacturing facilities from time to time to properly take care of growing interest in its products.

Two divisions of H. K. Porter Co., Inc., have opened a joint sales and service branch office at New Kensington, Pa.

Quaker Rubber and Leschen Wire Rope plan to serve West Virginia, eastern Ohio and western Pennsylvania from the new location at 450 Second St. The new center provides offices and warehouse space for both divisions.

WISSCOLOY® SPACE SCREENS

You cut screening costs right from the start, when you use CF&I Wisscoloy Space Screens . . . these rugged, general-purpose space screens are economy-priced.

What's more, you continue to save on cost-per-ton of coal screened . . . because Wisscoloy Space Screens are made to exacting standards, from tough, special alloy steel wire that's tightly woven, carefully crimped. The result is a quality screening that provides maximum accuracy plus long life. *Other CF&I Space Screens solve specific coal screening problems:*

CF&I Manganese Space Screens—are extremely shock-resistant, last longer on scalping operations and other tough screening jobs.

CF&I Stainless Steel Space Screens—give top quality performance in washing and other operations where wet, corrosive materials must be processed.

There's a CF&I Space Screen designed to meet your coal screening requirements. They're furnished in a wide range of standard dimensions, can be supplied with any specified edge preparation. Contact the CF&I sales engineer in our office nearest you.

4275

CF&I SPACE SCREENS
THE COLORADO FUEL AND IRON CORPORATION

In the East
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York Philadelphia

In the West
THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte Denver • El Paso • Ft. Worth • Houston • Lincoln • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland Pueblo • Salt Lake City • San Antonio • San Francisco • San Leandro • Seattle • Spokane • Wichita
CF&I OFFICE IN CANADA: Montreal
CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

James W. Forman has been named sales manager of Fairmont Machinery Co., Fairmont, W. Va., succeeding Vause R. Graves, who becomes manager of coal preparation.

Mr. Forman served for 5 yr as preparation engineer with Pocahontas Fuel Co., Inc., before joining Fairmont Machinery Co. in 1954. Since coming to Fairmont he has served as service and preparation engineer, including 3 yr as project engineer on the Eastlake Drying Terminal of the 108-mi coal pipeline from Cadiz to Cleveland, Ohio.

Atlas Powder Co. recently dedicated its new technical center at Wilmington, Del.

The $3 million facility, located next to the company's general office which

was opened 3 yr ago, houses the basic research and chemical-product development activities. Speakers at the dedication ceremonies were Gov. J. Caleb Boggs, of Delaware, and Ralph K. Gottshall, president of Atlas.

Appointment of John W. Wade as works manager of its New Philadelphia, Ohio, plant has been announced by Joy Mfg. Co.

The plant is the manufacturing facility for many of Joy's coal machinery and industrial products, including conveyors, extensible belts, cooling and ventilating fans and dust collectors. Mr. Wade was formerly vice president and director of the John C. Virden Co., Cleveland, and before that senior administrative engineer for Ford Motor Co. and Sears, Roebuck & Co.

Okonite Co., Passaic, N. J., opens Midwest regional sales offices.

Elbridge H. McNeill has been named regional sales manager of the newly-formed Midwest sales region of Okonite, with headquarters at Chicago. He will supervise sales of the company's wire and cable products in the Chicago, St. Louis and Rocky Mountain sales areas. A member of the Okonite sales force since 1925, Mr. McNeill has served as Chicago district manager for the past 5 yr. This post has been assumed by Robert B. Zane, formerly district engineer in the territory.

Bird Machine Co., South Walpole, Mass., has elected Calvin A. King first vice president and Henry H. Shepherd vice president in charge of sales.

Mr. King has been associated with the company for 12 yr, recently as assistant to the president. Mr. Shepherd has been with the company for over 20 yr and was general sales manager prior to his election as vice president. Mr. Shepherd will continue in charge of sales of the complete line of Bird machinery, including solid-liquid separating units.

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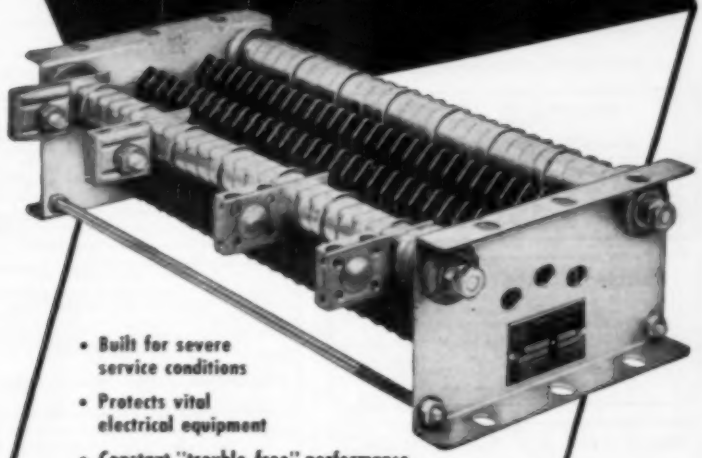

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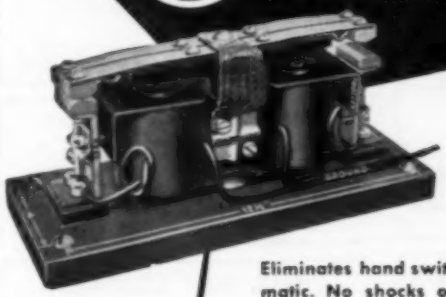

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***Indicates more product information may be found in company advertising appearing in COAL AGE 1958 Mid-July Mining Guidebook and Buying Directory Issue. Check your Guidebook index.**

Acme Machinery Co. 10

*Allis-Chalmers Construction Machinery Div. 22-23

*ACF Industries Inc. American Car & Foundry Co. ..... Third Cover

American Oil Co. 51

*American Pulverizer Co. 137

*American Steel & Wire Div., United States Steel Corp. 18-19

*Anaconda Wire & Cable Co. 34

Baltimore & Ohio Railroad 143

Bethlehem Steel Co. 43, 95, 111

Bird Machine Co. 4

*Bixby-Zimmer Engineering Co. 40

Bucyrus-Erie Co. 33

*Cardox Corp. 37

Caterpillar Tractor Co. 156

*Centrifugal & Mechanical Industries Inc. 144

Colorado Iron Works 133

*Compton Inc. 30

*Denver Equipment Co. 130

Differential Steel Car Co. 44

Dodge Div. Chrysler Corp. 131

*Dravo Corp. 36

duPont de Nemours & Co. E. I. (Elastomers Div.) 123

duPont de Nemours & Co. E. I. (Explosives Div.) 103

Durakool Inc. 134

Ensign-Bickford Co. 64

Ensign Electric Co. 136

Euclid Div. General Motors 113

Fairbanks Morse & Co. 100

Fairmont Machinery Co. 45

Firestone Tire & Rubber Co. 8

*Flood City Brass & Electric Co. 89

Ford Motor Co. 84-85

Fuller Manufacturing Co. 49

Goodman Manufacturing Co. 47

Goodrich Industrial Products Co. B. F. ... 1

Goodrich Tire Co., Div. B. F. Goodrich Co. 125

Guyan Machinery Co 140

Hamilton Rubber Co. 145

*Hendrick Manufacturing Co. 144

*Heyl & Patterson Inc. 35

International Harvester Co. (Construction Equipment Div.) 57

International Harvester Co. (Payhaulers) 58-59

Jeffrey Manufacturing Co. 83, 109

*Joy Manufacturing Co. 6, 54, 102

Kelly Manufacturing Co. 135

*Kennametal Inc. 141

Koehring Co. 14-15

Lee-Norse Co. 62-63

*LeRoi Div. Westinghouse Air Brake Co. .. 48

LeTourneau-Westinghouse Co. 39, 41

*Link-Belt Co. ..... Fourth Cover, 134

*Long Co. 29, 50

*Ludlow-Saylor Wire Cloth Co. 54

Lukens Steel Co. 98

Marion Power Shovel Co. 129

*McLanahan & Stone Corp. 38

McNally Pittsburg Manufacturing Co. 128

Metallurgical Products Div. General Electric Co. 121

*Mine Safety Appliances Co. .... Second Cover

National Mine Service Co. 42

Neff & Fry Co. 46

New York Rubber Co. 147

Ohio Brass Co. 77, 115

Okonite Co. 127

Page Engineering Co. 20-21

*Paris Manufacturing Co. 56

Porter Co., Inc. H. K. Quaker Rubber Div. ..... 138 Connors Steel Div. 139

Post-Glover Electric Co. 149

Republic Steel Corp. 16-17

Roeblings Sons Corp., John A. 107

*Salem Tool Co. 52

Sanford-Day Iron Works 90-91

Searchlight Section 150-154

Simplex Wire & Cable Co. 31

Sinclair Refining Co. 61

Spencer Chemical Co. 55

*Stamler Corp., W. R. 132

Standard Oil Co. of Indiana 24-25

Sun Oil Co. 12-13

*Texas Co. 2-3

Timken Roller Bearing Co. 27

Union Wire Rope Co. 78-79

United States Rubber Co. Mechanical Goods Div. 119

*United States Steel Corp. 53, 117

*Victaulic Co. of America 142

Whitmore Manufacturing Co. 140

Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp. 148

Wildbrugg Instruments Inc. 146

Wilmot Engineering Co. 60

Wilson Marine Transit Co. 135

PROFESSIONAL SERVICES 150

CLASSIFIED ADVERTISING

F. J. Eberle, Business Mgr.

EMPLOYMENT OPPORTUNITIES 150

EQUIPMENT ..... (Used or Surplus New)

For Sale 150-154

Wanted 153

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Ripping with one tooth of its No. 9 Ripper, D9 makes 100-foot furrows 40 inches apart at Reliance Mine pit.

At the Reliance Mine of the Peabody Coal Company, Clinton, Mo., a thin seam of bituminous coal is being broken up by a CAT D9 Tractor with No. 9 Ripper. In a few hours a day, the D9 rips enough coal in the two Reliance pits to keep them operating all day. The D9 is also used for general bulldozing work.

The No. 9 Ripper comes equipped with a single tooth in the center, but the special design and sturdy construction of this attachment make it possible to add two more —one on either side. When ripping coal a single tooth is used. The tooth pivots 10 degrees to either side to allow easy steering. Ground penetration, down to 28 inches. The No. 9 Ripper teeth are made of alloy steel with replaceable tips.

Caterpillar Dealers also offer the single-tooth Kelley Ripper on the D9, with depth penetration down to 5 feet; a new and proven combination for thick seam coal.

The D9 has the power for a profitable ripping operation —260 HP at the drawbar, 320 HP at the flywheel. It has heft—over 36 tons of operating weight with bulldozer. It's maneuverable—hydraulic boosters provide easy steering, braking and clutching. Yet it will not break up the coal because of low ground pressure tracks.

To match your needs, the D9 is available with torque converter or direct drive with oil clutch. For complete information, see your Caterpillar Dealer. He has the facts and figures on the D9's performance on mining operations. And he'll be glad to give you an on-the-job demonstration.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

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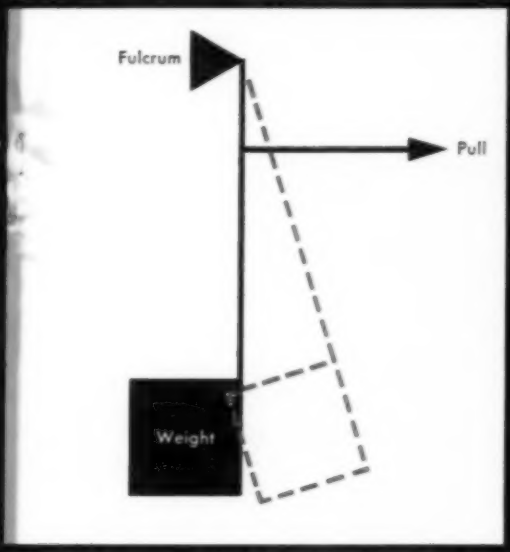

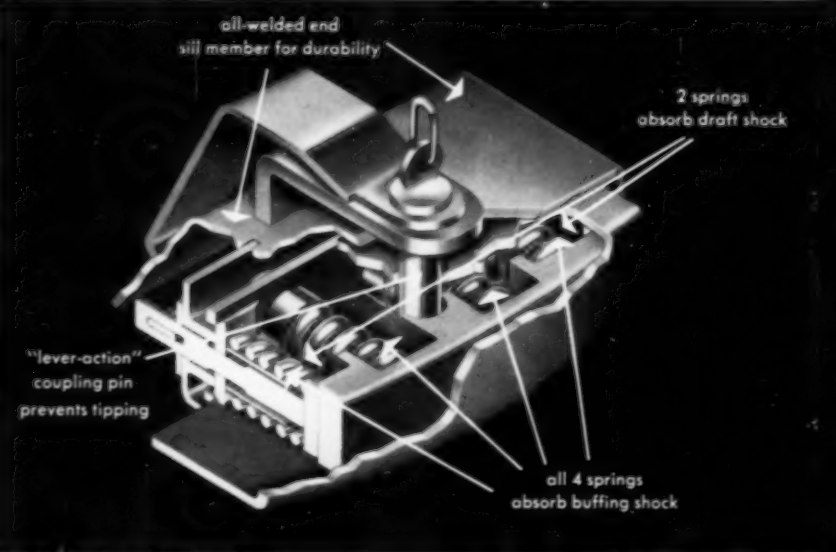
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2 springs absorb draft shock
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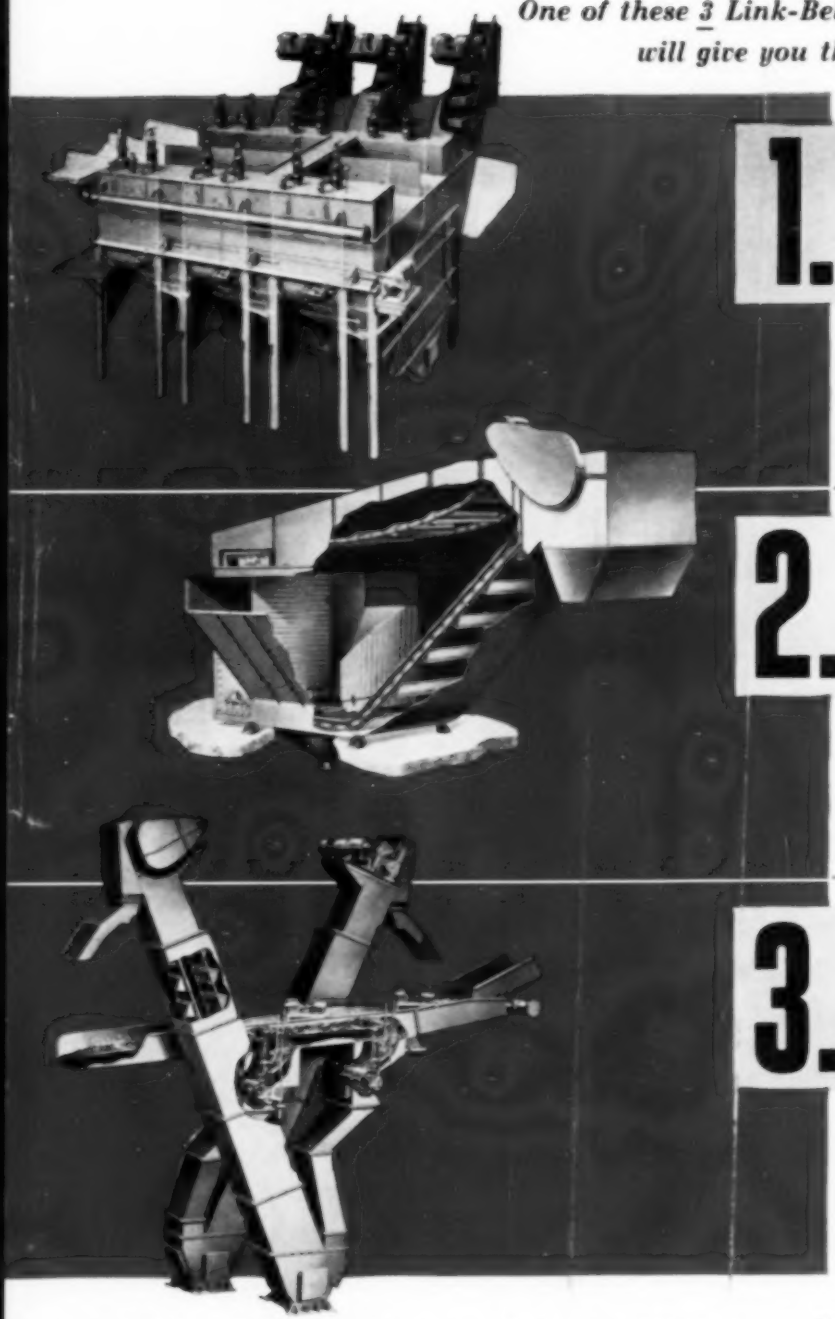
Any seam..any market-

One of these 3 Link-Belt coal washers will give you the most economical cleaning



1. AIR-PULSATED WASHBOX

Extremely flexible for high-capacity cleaning of sized or unsized coal, Link-Belt air-pulsated washers are available in single and double bed models to satisfy all capacity requirements. The new dual bed model (pictured) has higher capacity due to increased washing bed width and individual bed controls . . . provides sharper separation over the entire washing area. Both models can incorporate the new Aeropoise refuse control for completely automatic refuse discharge.

2. FLOAT-SINK CONCENTRATOR

Utilizes the heavy-media separation process in a magnetite and water mixture. Efficient for extremely high or low specific gravity separation . . . when a large percentage of coal is near the separation gravity . . . when amount of impurities in feed fluctuates or product must be quickly changed. Cleans larger sizes, minimizing manual picking. Pictured is the Link-Belt tank-type, float-sink concentrator. Drum-type is available to suit varying coal conditions.

3. TROUGH SEPARATOR

The Link-Belt trough separator is used in combination with the air-pulsated washbox to handle large tonnages requiring more than one washer, with little added investment or operating expense. Trough floats off a large part of the coal, so clean that it requires no further treatment. The remaining portion, a mixture of coal and refuse, is fed to the air-pulsated washer for final refuse removal.

JOIN the many progressive mine operators who have found Link-Belt washers the answer to today's exacting coal specifications. Our engineers will be glad to work with you and your consultants . . . help you choose the right equipment for a cleaner, more marketable coal at lower cost.

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LINK-BELT COMPANY: Chicago 9, Birmingham 3, Cleveland 20, Denver 2, Detroit 4, Huntington 9, W. Va., Indianapolis 6, Kansas City 8, Mo., Louisville 2, Pittsburgh 13, Seattle 4, St. Louis 1, Scarboro (Toronto 13), Springs (South Africa).

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